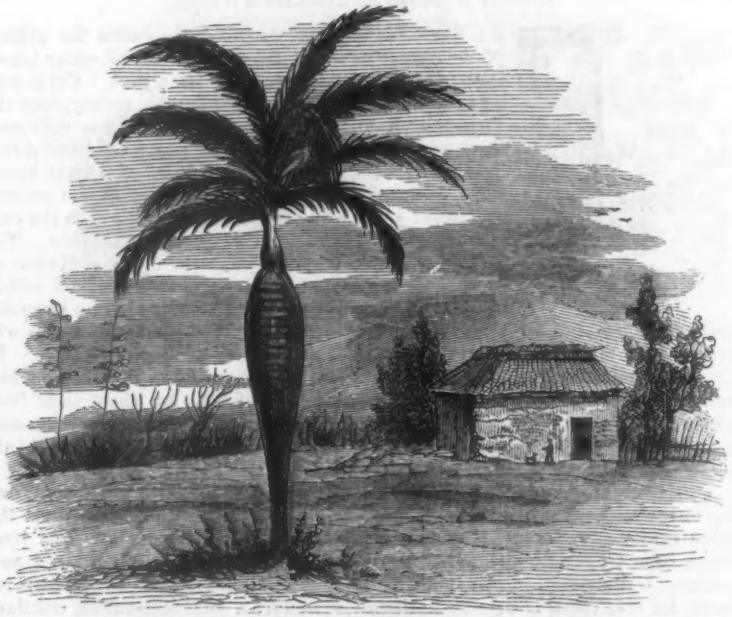
A Trip to Cuba and the Southern States, No. 6.

"Fair land of Cuba! on thy shores are seen
Life's far extremes of noble and of mean;
The world of sense in matchless beauty dressed,
And nameless horrors hid within thy breast;
Ordained of Heaven the fairest flower of earth."

PALMS.—Linnæus rightly called the Palms the princes of the vegetable world, for they surpass all other plants in the grandeur and majesty of their port. Cuba possesses such numbers, and a considerable variety, that the *Laplander* from the United States, who has only seen them cramped in hothouses, is perpetually delighted. Their lofty stem, supported by a mass of fibrous roots, which frequently creep along the surface of the ground, consists of wood with longitudinal fibres, soft in the centre, but hard as horn itself at the circumference. The fruit is a drupe, or berry-nut, with either a fibrous or fleshy coat. Most of the species are confined within fixed and narrow bounds, few extending over a large extent of surface. Von Martius thinks it probable that the number of Palms will be found, by future travellers, to amount to as many as a thousand species. In the times succeeding the deluge, they appear, from the written evidences of historians and poets, to have followed the footsteps of man, to whom their fruit yielded food, drink, and oil; their stems, houses, arms, utensils, flour, and wine; and their leaves, cordage, and roofs for habitation. In cultivation, their soil should be slightly saline.

Cutting down a Palm-Tree.—One morning, our party obtained permission from the owner of a coffee plantation to cut down a Royal Palm, in order to get the much esteemed cabbage. Taking a workman, we found a moderate-sized tree, which soon yielded to the strokes of the axe; the wood is coarse-grained, and presents, in the centre, a pithy appearance. It was somewhat of a hazardous request, for this Palm is held to be almost sacred from such desecration, meeting, as it does, so many of the wants of man; the head is sometimes wantonly cut off by marauders, to procure the cabbage, and the tree inevitably dies in consequence. When the tree fell, the stem was divided at the well defined point of junction of the green and light lead-colored bark; the green or top portion was about eight feet in length when the plume was removed. Our axe-man shouldered this, and took it to the house, and we enjoyed the pleasure of unrolling the sheath, which extends from the bottom of the lowest branch, and enfolds the green stalk. Each branch or leaf has a sheath extending downwards, and enfolding the cabbage in the most extraordinarily white successive layers, each of which represents a footstalk and leaf. Unwinding these (if the expression may be allowed), we come at last to the colorless younger embryo leaves constituting the cabbage. These are sufficiently soft and delicate to be eaten raw, tasting something like an uncooked cauliflower, but more delicate. The leaves, as they expand, are strongly attached to the sheath, and fall in succession, about monthly, one at a time, and cover the ground, being from ten to twenty feet in length; the leaf at the outer end is formed like the feathers on a quill, and the broad stem, which we have called a sheath, having acquired the strength and consistence almost of a board, and as a substitute for a board, it is used for thatching, for making inclosures, and the thinner portion as we see it around seroons of tobacco. There are fifteen or twenty forming the lovely, tuft-like plume—the younger leaves at top. The dropped lower leaf leaves

a ring around the stem, which soon assumes the lead color of the bark, the ring remaining distinctly visible, and marking the successive falls. A broom-like seed-vessel shoots out, of a pale yellow, from the top of the lead-colored trunk and



Palm, with swelled trunk, common near Trinidad de Cuba. Height, 25 to 40 feet.

base of the green sheaths above it; as this blossom falls, a green berry is formed, and this gradually becomes the small brown drupe forming the principal food of swine. Another and another bunch is produced, and we have blossoms and ripe fruit in perpetual succession, each tree with bushels on it. Here is the food, boards, fuel, and thatching. Palms, taking the whole family, yield, in addition, fibre of great variety, oil, wax, starch, sugar, daily food, a mild and an intoxicating drink, or, as the poet has it—

> "The Indian-nut alone
> Is clothing, meat and trencher, drink and pan,
> Boat, cable, sail, and needle, all in one."

The Palms belong to the Endogens, the woody matter being constantly developed, in the first instance, towards the interior of the trunk. That Palm-trees grow in this way, was known so long since as the time of Theophrastus, who distinctly speaks of the differences between endogenous and exogenous wood. The longevity of Palms is inconsiderable when compared with that of exogenous trees. Two or three hundred years are estimated to form the extreme extent of life in a Date-Palm, and in many others.

We had the "cabbage" dressed for dinner as we dress a cabbage at home, with

vinegar, in which state it was much relished. A portion of the large mass was boiled, but so badly cooked, in our estimation, and mixed with such desperately bad butter or oil, that a little was enough. The whole of the cutting down, the unrolling process, and examination of the delicate white folds, offered an example of vegetable structure on a large scale, of very great interest, and we are very sure that none of the American party will ever forget or regret the morning thus employed.

At Mr. Monson's (the old coffee plantation), we had fine opportunities of observing the novel insects, which are abundant in all tropical countries. A kind of wood lice, called *comehen*, build enormous deformities, of the consistence of a wasp or hornet's nest, on the stems of trees as well as their branches; the paper-like layers are extremely thin, and easily attacked by birds, which feed upon them with avidity. The nests are so large as frequently to contain a bushel of insects; these the natives carry off, to feed and fatten their chickens. The beautiful cucculios, or great fire-flies, had not arrived when we left, so that we missed this famous sight. Spiders, lizards, centipedes, and tree-frogs, are abundant; the little lizards are quite pretty, and seem to have no fear of man, whom they look at with their beautiful and cunning eye, and allow him to scratch their heads. Birds, except a parrot-billed blackbird, were not numerous at this early season, though flocks of partridges occasionally flew up with their well known *whir*. The wild dove was plentiful in market, and a favorite food.

About this region, but more especially on the southern side of the island, one of the great annoyances to the botanist is a vine not inaptly called the *wait-a-bit*. It pervades every uncultivated woods, where it makes a pedestrian progress very difficult. A short hooked spine at every bud and every joint of the tough branches, and even of the leaves, not very unlike a fish-hook or a short hooked thorn bent backwards, and very sharp, tears one's clothing, and is really a formidable enemy. The compensation for all this, is the quantity of gorgeous flowers at every step; among these is the vanilla vine, with a bright green stem, the flowers white, of a lily shape, and waxy appearance. Sometimes, in such rambles, you come to orchideous plants large enough to fill two wheelbarrows.

Matanzas.—Having engaged passage to New Orleans, we found time only for a short visit to Matanzas. Understanding that the accommodations of the hotels were desperate, we took pains to find out the best, and as everybody agreed that the *Ciervo de Oro* (the Golden Stag) took precedence, on arrival by rail, our party drove to it; externally, it was of respectable proportions, with its name displayed in huge letters, over a Moorish arch. The bar was rather prepossessing at first entrance, but no booking of names was needed, and the landlord appeared quite indifferent to his customers, though we constituted his entire stock of that important hotel article. At last, more by signs than understood words, we were shown to our rooms, and such we hope never to be placed in again. To say that they were dirty, is mild language; in fact, they had evidently never been scrubbed or cleaned with anything better than a whisk. The rough floors were grimy beyond endurance. Very soon we all decided to depart by first opportunity, for no sleep could possibly be had in such beds. On inquiry, it was found that a steamboat in good repute would depart for Havana in the evening. It was difficult to ascertain at what hour, for Matanzas that evening rejoiced in an opera, and the boat was to leave *when the opera broke up!* which would be at eleven or twelve o'clock. We concluded to get some dinner, look at the town and the celebrated valley of the Yumuri, and be ready at the earliest hour named.

The cook's department was unfortunately prominently in view, and it soon appeared that the Golden Stag was a restaurant to supply the families of Matanzas who kept no cooks. Fine fish were prepared for the fire, to be ready at the shortest

notice; as soon as this was accomplished, they were set on a table in the hollow square below our windows, in the full blazing sun, to await orders. The flies immediately covered every part, leaving no pleasant prospects for American tastes; other viands, including meats, shared the same fate. The dinner, notwithstanding, looked well on the table, and though basted with sweet oil and garlic by the old blackman cook, and charged very unreasonably, was not unacceptable to hungry travellers. The town is situated on a bay more noble in its dimensions than that of Havana, and bore evidences, in the shipping in port, of an extensive commerce; but it was a dull sort of place, with a handsome Paséo well planted with the Cuban Cedar, but nobody riding on it. The air of a capital so evident in Havana, was entirely wanting; and after a ride to see everything of interest, we were glad to desert our poor quarters, and row off to the steamer.

About twelve o'clock, the opera performers and many of their audience, were fraternizing on board; the paddles moved, we were off to sea, on a fine, warm, starlight night, passed the Moro again, at daylight, and breakfasted with an appetite somewhat sharpened by short commons in the interior.

The Cathedral containing the ashes of Columbus, is of course one of the sights that attract all visitors; the much vaunted monument is a mural tablet of small size, with an effigy of the discoverer, representing him as a young man; it is entirely unworthy the subject. The so-called military mass in the Cathedral and the other churches, much sought for by strangers, is totally uninteresting. The soldiers are marched in in clean linen dresses, and stand perfectly still, but with eyes wandering, to inspect the assembled strangers, while the priest goes through the Catholic service, when they are marched out again. As to the soldiers (who are all from old Spain), we should say they were taller men than those composing the French army, and really very good-looking fellows, especially in Sunday garb. The Sabbath is about as much kept as in Paris; bull-baits and cock-fights, and the negroes, by imprescriptible custom, dancing outside the walls—street watering with an awkward machine with a long tail, held by ropes in the hands of two opposite pullers, who water the passengers in the street without mercy—volante driving on the Paséo—open shops and markets till after noon—comprise the employments of the inhabitants. The churches are better attended in the morning than on other days, but mainly by women. The rich arrive in their volantes; a servant spreads a gay house-rug on the marble floor, and the ladies kneel a short time, and depart. In several instances, their servants in attendance were Chinamen, who looked very much at home in these religious premises. The poor who had no rugs, either spread an old handkerchief, or kneeled on the cold floor.

Many, indeed most of the streets in Havana, are so narrow, that in those devoted to shopping an awning is spread (overhead) from one side to the other. Vehicles, by law, all go one way; so that you have to go roundabout to get into the current. The shops are extremely shallow; the goods are brought out to the female shoppers, who sit in their volantes to make bargains. The only shops that bore a strong resemblance to our own, were the silversmiths, who carry on, apparently, a thriving trade, and make a good display of their wares. The apothecary is perhaps the next approach to our mode, but his medicines are kept in vessels and gallipots of novel construction. You never could find a doctor or a lawyer without minute directions, as nobody (not even the bankers or merchants) ever puts up a sign of any kind; you must find them by some other process. The shopkeepers likewise conceal their names, but adopt a sign, either poetical or fanciful; one is La Bomba, El Sol, La Vergen, La Grand Signora, California, the Oranges, &c.

Everybody has heard, no doubt, of the curious custom of keeping the volante in the entry, but no one who first encounters the carriage in that position, can do

so without an involuntary surprise. The first day we dined out, the entry communicated with the dining-room, and there was but just space enough for the Chinese waiters to pass between the back of the chair and the wheel of the bedizened coach, which, we heard afterwards, had a thousand dollars' worth of real silver for its mountings.

One of the novel sights to a stranger, is the mode of supplying corn-stalks for horse feed from the rural districts to the town consumers. Hay, unless imported, is out of the question; corn-stalks are substituted, and these are supplied daily, in a fresh state, brought on the backs and sides of small horses, with the same regularity as milk is distributed in our cities. All the approaches to Havana as well as all its streets exhibit strings of horses in single file, those in the rear tied to the tails of those in advance, and all of them literally thatched over with green stalks, nothing being visible but the muzzled head and the small feet. The *arrieros* come in from a distance of six, and even ten miles, and proceed to serve their customers, dropping a half-dollar bundle at successive houses, for the day's supply. The poor little horses carry enormous weights in this way, and look, on a larger scale, like the insects which pack themselves away in green leaves for winter quarters. As they stand patiently to be gradually unloaded, it is amusing to see their quiet but vain attempts to snap at a branch of the corn, with an expression which plainly says: "I want it badly, but know I can't get it!" These *arrieros* come to town in the same style, with loads of various produce, the horses always in this single file, just as they came in the days of Don Quixote, and with most awkward baskets and panniers swung on the horses' or mules' backs. Everything seemed to go in a pannier; a keg of molasses or a demijohn, is pushed into a pannier, and is carried in or out of town in this most awkward way. The Palm leaves are worked into the sides and tops of wagons, when these are employed for heavy goods like sugar hogsheads, and the whole arrangements seem to speak of the middle ages. The horse requires a daily bath in such a warm climate, and they are fastened heads to tails, and swim about in shallow parts of the bay, in a circle; happy the little Spanish boy when he can throw himself on one of their backs, and get a ride and a swim at the same time.

We were sitting one evening with a Spanish gentleman, in Havana, in a well-lighted room, paved with marble tiles, when a scorpion ran across the floor very near us; a little boy put his shoe upon it, and crushed it at once. The circumstance was pronounced very unusual, and led to the assertion of several natives, that the Cuban scorpion is, to most, harmless; its sting inflicts about as much injury, and of the same duration, as the sting of a bee. Both, however, affect different persons differently; some more, and some less, but neither are dangerous.

We have alluded to the Royal Tacon Paséo, and as this drive and the Cathedral furnish illustrations* for our present number, we may say of it that in its original outlines it has great merit. The view represents the beginning just outside the walls, where the arch in the wall opens an entrance to this rural drive. It is well planted, and is statued with Carlos and Christinas in marble; but these royal effigies and other emblematical devices are mounted on stuccoed columns in a state of dilapidation. The fountains represented seemed to be in decay, and were never played, water being scarce. Altogether it presents a truly Spanish scene—a combination of civilization and pretension, surrounded with meanness and constant evidences of semi-barbaric neglect.

* For several of our previous illustrations we have been indebted to the able pencil of our friend Ledyard Lincklaen, Esq., of Cazenovia, New York, who preceded us by a few weeks only. In the December number these sketches of Cuba will be concluded, and a few remarks on the Southern States will be commenced in our next volume.

Fig. 1.

ORNAMENTAL IRON WORK.

Iron ornamental work continually increases in variety and importance, and usurps the place of other materials. It was but yesterday that iron bedsteads were introduced, and now we have all kinds of chairs, settees, vases, lamps, summer-houses, &c.

Fig. 1 represents a lamp, quite perfect in its form and rivalling the beautiful castings in Berlin. We obtained this pattern and Fig. 2 from Mr. Robert Wood, of Ridge Avenue, Philadelphia, celebrated the Union over for his iron railings and ornamental castings.

Fig. 3 is also made of iron, and when these are bronzed they are beautiful household furnishings.

Fig. 4 represents a stand for flowers, to be placed on a piazza, in a hall of entrance, or drawing-room, and should be either highly painted and varnished, or, what would be preferable, bronzed. The cups catch and retain any water that may leak from the flower-pots.

Fig. 2.

Fig. 3.

Fig. 5.

Fig. 4.

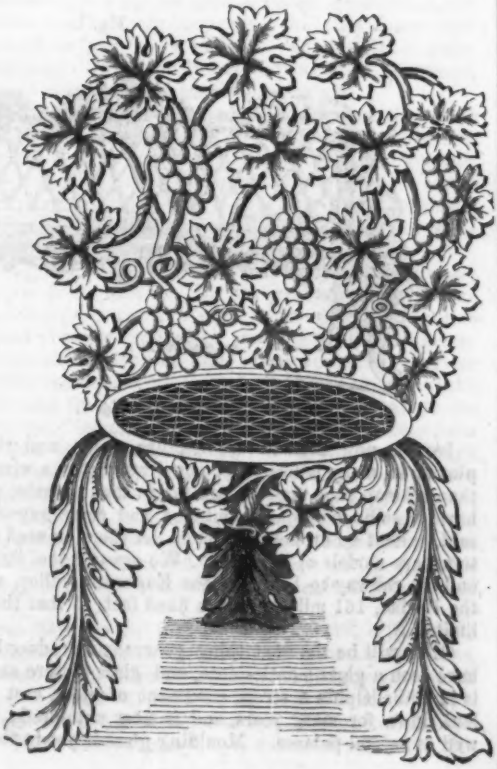


Fig. 6.

Figs. 5 and 6 are chairs, much used in the open air and for cemetery lots, and the benches, Figs. 7 and 8, are similarly employed.

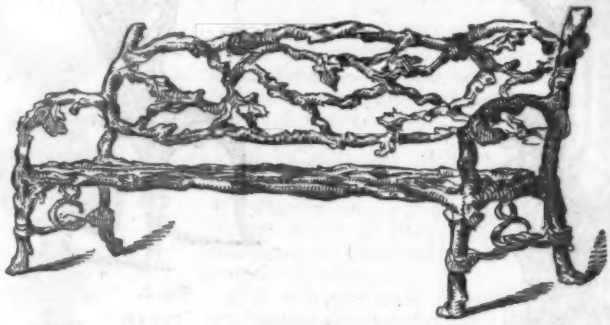


Fig. 7.

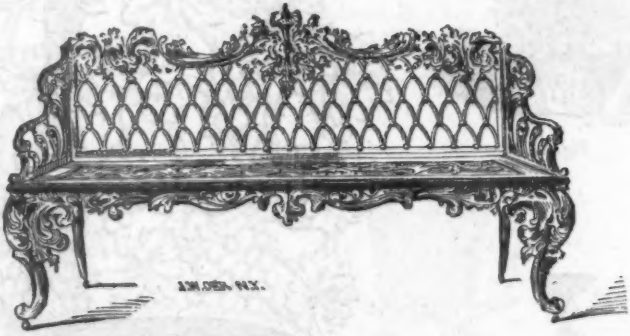


Fig. 8.

Iron is now used in architecture, ships, and rigging. Wire ropes are employed in many mines. At equal strengths, a wire rope is lighter by one-third than a hemp rope, and by two-thirds than a chain, an important fact. Then we have metallic life-boats, pontoons, and army-wagons; the boats now made, it is said, cannot be broken or overset, let them be used ever so roughly, and the pontoons are models of lightness. We are to have, they say, railroads to California, and the railway to India, by the Euphrates valley, while that from Honduras to the Pacific, 161 miles, seems a fixed fact, so that the demand for iron will be unlimited.

Glass will be the next thing generally introduced, and for new purposes. We have seen a glass mantle-piece, and glass picture and looking-glass frames; there is in Philadelphia a street pavement of glass, cast in octagons, which has been laid down for many years, and is now uninjured; why not glass tables, &c., as well as crystal palaces. Moulding glass is yet in its infancy.

BIOGRAPHICAL MEMOIR OF THE LATE FRANÇOIS ANDRÉ MICHAUX.

BY ELIAS DURAND.

[From the Transactions of the American Philosophical Society, Volume XI. p. xvii. Read December 5, 1856.]

François André Michaux, the subject of this memoir, belonged essentially to that class of scientific explorers who, by their devotion to science and their energy in promoting the welfare of mankind, may justly be viewed in the light of benefactors of their race.

When we consider the noble spirit with which such men enter upon their hazardous enterprises—when we witness the fortitude with which they encounter the fatigues and inconveniences of their distant voyages in regions as yet unexplored—we cannot withhold from them the expression of our admiration. It is not a spirit of egotism that moves them onwards; it is not for their personal gratification, nor with the view of enriching themselves by their discoveries, that they desert their family hearth and separate themselves from the fatherland. Their object is disinterested, and of the noblest character. They labor for the advancement of science, and, above all, for the benefit and enjoyments of their fellow-beings.

To what toils, to what privations and dangers, must they not necessarily expose themselves in order to attain the object they have in view? Behold them wending their way through inextricable forests; through pestilential marshes; over grounds untrodden by the human foot—struggling and panting under the rays of a torrid sun, or shivering under heavy showers of rain—now clambering over steep rocks, and next descending into deep precipices, constantly exposed to dangers of every description.

To men of this class we already owe many of those succulent vegetables which cover our tables; those delicious fruits which enrich our gardens and orchards; those fine trees, shrubs, and flowering plants which grow by the side of our native trees, ornament our parterres and pleasure-grounds, or are cultivated in our greenhouses. The peach, the apricot, the cherry, the almond, as well as the greater part of our most valuable garden vegetables, were obtained from Asia, the cradle of the human race; the walnut came from the Black Sea; the pear, the apple, the chestnut, from the forests of Europe; the orange from India; the sugar cane from China; the maize and potato from South America, &c. And, ere long, through the persevering exertions of François Michaux, Europeans will enjoy, in their own fields, the refreshing shades of the finest and most useful trees of our native forests; of those, especially, which are employed in civil and naval constructions, or in cabinet work. As Americans, we are ourselves under peculiar obligations to him for an accurate knowledge of our forest-trees, and for the good advice which his experience has enabled him to give us on points of national economy connected with arboriculture.

François André Michaux was born on the 16th of August, 1770, at Satory, a royal domain situated in the vicinity of Versailles, which, for several generations, had been intrusted by the Crown to the administration and management of his ancestors. He was the only son of André Michaux,* who, with Catesby, Clayton, Bartram, Kalm, and Walter, was one of the pioneers of botanical explorations in the North American regions. His mother, Cecile Claye, was a daughter of a rich

* See Horticulturist, page 353, *ante*.

farmer of Beauce. She died eleven months after her marriage, leaving behind her a son, the subject of this notice.

Of the early life of François André Michaux, I have not been able to collect much information. It is probable that he was brought up on the farm of Satory, in the practical school of his father and of one of his uncles, upon whom devolved, after the departure of the former, the sole management of this extensive royal estate. It may be inferred, also, from his writings and instructive conversation, that his collegiate education had not been neglected.

His father, whose history is inseparably linked with that of his son, had devoted all his life to the progress of agriculture and the sciences; his main ambition had been to effect something that might redound to the advantage of his native country, and, with this view, he had early turned his attention to agriculture, the advancement of which, he had soon perceived, could not be more securely attained than by enriching its domain with such products of foreign climes as were unknown to his own country, and susceptible of acclimation. In order to accomplish his object, he determined to visit new regions, possessing climates similar to that of France, and to bring back thence such of their productions as might prove of advantage to his native land.

To effect that purpose, he prepared himself by a proper course of studies, and by devoting his particular attention to the science of botany, under the great Bernard de Jussieu. He first visited England; he next made several explorations in the mountains of Auvergne, and in the Pyrenees; then in Spain; and embarked afterwards for Persia, in the capacity of secretary to the French consul at Ispahan, but, in reality, for the sole purpose of exploring that country, then almost unknown to scientific men. From 1782 to 1785 he surveyed the whole of the Persian provinces between the river Tigris and the Euphrates, and returned to France with an extensive collection of specimens and a large quantity of seeds of every kind.

During the absence of the elder Michaux, the French government had been agitating the important question of introducing into the forests of France such exotic trees as would be calculated to increase the national resources, with respect to naval constructions. The information which had been received from the United States, in this regard, had been exceedingly encouraging; and Michaux, who had just returned from Asia, was chosen for that particular errand, with instructions to procure for the royal nurseries all the young trees, shrubs, and seeds he could possibly send. In consequence, he made all proper preparations, and embarked at L'Orient on the 25th of August, 1785, taking with him his son, then only fifteen years of age, and a journeyman gardener of the name of Paul Saulnier, of whom I shall speak hereafter. They landed at New York on the first of October following.

At this remote period of time, I am altogether without record as to the movements of young Michaux immediately after his landing on our shores. The only source where I expected, naturally, to obtain information, was the manuscript journal in which his father was in the habit of registering the daily incidents of his eventful life, and which had been deposited by his son in the library of the American Philosophical Society. Unfortunately, this journal has become incomplete through the absence of three of its fasciculi, containing the years 1785, 1786, and 1790, which were lost in the shipwreck of the elder Michaux on the coast of Holland. In the fasciculus of 1787, young Michaux's name appears for the first time on the date of May 6, as accompanying his father in his exploration to the sources of the Keovee River. In the next spring he is seen again with him, journeying into the interior of Florida. He is afterwards mentioned several times as being retained at the Charleston Nursery, either on account of ill health, or

intrusted with the management of the plantation, during the journeys of his indefatigable and ever moving father.

In the further perusal of the manuscript, I learn, at the date of the 20th of September, 1789, that his son, walking along the road, was hit by a man shooting at partridges, and that a grain of shot had penetrated his left eye, below the pupil. From that date to December following, he occasionally speaks of the state of his son, of the treatment applied to his case, and, especially, of the great despondency of mind which the patient had fallen into, from the apprehension of losing his eye. But here, again, we arrive at the third lost fasciculus, and I cannot ascertain the final result of the accident, nor at what time, precisely, young Michaux returned to France.

His return must have taken place in the first three months of 1790, for in the manuscript of the following year, on the 17th of January, the elder Michaux acknowledges the receipt of a letter from his son, dated Paris, April, 1790, but nothing more is said about the wounded eye. To that accident may be attributed the partial deprivation of sight with which Michaux was afflicted.

Young Michaux reached his country at the very outbreak of the French Revolution, in which he is said to have warmly sympathized with the republican party. Such a course was not, perhaps, expected from one who had been brought up on a royal domain, and was, to a certain degree, indebted to royal munificence. But his exalted patriotism, his ambition to serve his country, his frank and bold temper, his love of liberty imbibed in this free and happy land—all these together must have raised his spirits to a high pitch; but what must have been the vexation he experienced when, on his return, he scarcely found a few remnants of the several hundred thousand young trees which his father and himself had reared in their American nurseries, and sent home for the particular benefit of his country. One-half had been given away by the queen to her imperial father of Austria; the rest had been squandered among the minions of the court, to embellish their grounds, or shamefully neglected in the royal nurseries of Rambouillet.

In the mean time the elder Michaux was continuing his explorations in North America. He travelled in all directions, over more than three thousand miles, during the eleven years which he spent on this side of the Atlantic. While thus actively engaged, the political storm raging in his country had brought on immense changes in his situation. France, ruined by royal profligacy, invaded by famine, deluged with the blood of her best citizens, convulsed by civil war, and fighting single-handed with the whole of Europe, could no longer afford to pay her naturalists abroad. Michaux was forgotten, and ceased gradually to receive his salary. After having borrowed money on his own account, after having sacrificed a portion of his own and of his son's fortune, he found himself under the necessity of returning to his country. Unfortunately, he was shipwrecked on the coast of Holland, and, after having lost the best part of his immense collections, he arrived in Paris on the 26th of December, 1796, after an absence of eleven years and four months.

On his arrival in his native land, the elder Michaux occupied his time in the cultivation of the vegetable treasures which he had forwarded from the United States, and in arranging his materials for the *History of the North American Oaks*, and for his *Flora Boreali Americana*. In these various labors he was assisted by his son, who, in the mean time, was studying medicine under the celebrated Corvisart, and attending the clinical lectures of Désault, chief surgeon of the Hôtel Dieu, with the view of returning to the United States and devoting himself to the practice of medicine; but such was not his destiny.

Neither the retired habits of a student, nor the easy and monotonous life of a Parisian abode, suited temperaments like those of the two Michaux. Such men

needed activity, and change of scene, with its toils and perils. Both were animated with the same spirit of enterprise—with the same conviction that their efforts, employed in other directions, could afford more benefit to their country; hence they were endeavoring, through the influence of their numerous friends, to infuse their views and projects into the minds of their fellow-members of the Central Society of Agriculture, and of the ministers of Napoleon, then First Consul of the French republic.

In this they both finally succeeded. The elder Michaux accepted a commission of naturalist in the scientific expedition led by Captain Baudin, and bound to the Australian seas, on condition, however, that he would be permitted to remain at the Isle of France, if he desired so to do. Disgusted with Baudin's haughty manners and want of courtesy to the scientific corps, André Michaux abandoned the expedition at Mauritius, where he remained six months, and thence started for the island of Madagascar, which, he thought, would afford him better opportunities of advancing the science of botany, and making himself more useful to his country.

After sundry explorations along the coast, he established a botanical garden at Tametave, in which he planted all the trees and plants which might be objects of usefulness or curiosity. The climate, unfortunately, was exceedingly unhealthy, and, trusting too much to his good constitution and habits of exposure, he neglected the proper precautions, was taken sick with fever, and died at the end of December, 1803.

François André Michaux, on his own account, had not remained inactive. Aroused by the example of his parent, and now fully arrived at manhood, he could not look back to the unfinished work of his father in the United States without becoming alive to the most ardent desire to achieve the object which they had both in view. Conversant with several States of the Union, confident in his own experience and abilities further to serve his country, he was, on his side, earnestly soliciting a commission to the United States.

This opportunity was at last afforded to him through the celebrated De Chaptal, then Minister of the Interior, who, feeling dissatisfied with the result of the nurseries of New Jersey and Charleston since the departure of the elder Michaux, and thinking more benefit would accrue from the appointment of native correspondents in the principal seaports of the Union, consulted François A. Michaux in the matter, and appointed him to effect those objects. He gave him instructions, at the same time, to sell the properties when he had forwarded home all the trees and shrubs remaining in the two French nurseries above mentioned.

Michaux, highly gratified, set out immediately for Bordeaux, at which port he embarked for Charleston, with the same captain and on the same vessel that had brought him home thence, some ten years previous. After a short and pleasant passage, he landed at his place of destination on the 9th of October, 1801. He occupied himself almost immediately, and during the following winter, in sending to France the trees and shrubs of the nursery; and this part of his instructions being fulfilled, he embarked for New York on the same errand.

As soon as the season became favorable, he began his herborizations in New Jersey and along the banks of the North River. In these explorations he discovered several new species of oaks and hickories, the acorns and nuts of which he sent to France in abundance. He had also the opportunity of determining with more accuracy the botanical characters of the black oak (*Quercus tinctoria*), one of the largest trees of the American forests, and also one of the most valuable for the quality of its wood, as well as for its dyeing properties.

He next visited Philadelphia, where he had the pleasure of becoming acquainted with some of her most celebrated men, among whom he mentions the Rev. Dr.

Collin, Dr. Benj. S. Barton, Messrs. Vaughan, Peale, Wm. Bartram, &c. He visited with great satisfaction the botanical garden of the latter gentleman, and the magnificent greenhouses of Mr. Wm. Hamilton, which contained a rich collection of exotics, principally New Holland plants. His attention was more particularly attracted by the latter gentleman's romantic grounds, called The Woodlands, wholly planted with every American tree and shrub that could withstand the severity of a Philadelphia winter. Finding he had a few months to dispose of, he took advantage of this circumstance to visit the States of Kentucky and Tennessee, about which he had so frequently heard his father speak in the most enthusiastic terms.

He set out from Philadelphia on the 27th of June, 1802; passed through Lancaster, Columbia, York, Carlisle, and Shippensburg; then crossing the Alleghany Mountains, he reached Pittsburg in ten days, travelling alternately in stage, on horseback, or on foot. He left Pittsburg on the 14th of July, on foot, for Wheeling, and there purchased a canoe to descend the Ohio River, in company with an American officer of the name of Craff. In three days they reached Marietta, and on the tenth day they landed at Limestone, now Maysville. From that place he travelled alone to Lexington, which he left on the 10th of August for Nashville.

Michaux remained in Nashville four weeks, which were employed principally in botanizing around the town and along the banks of the Cumberland River. On the 5th of September he set out on his journey back to Charleston, by way of Fort Blunt, West Point, and Knoxville, which latter place he reached on the 17th, after stopping several days at the Falls of Roaring River, to explore the beautiful country around. From Knoxville he travelled to Greenville, and thence to Jonesborough, the last town of Tennessee. On the 21st he began crossing the high ridge which divides the State of Tennessee from North Carolina, and, after two days of the most toilsome journey through the mountains, he reached the farm of old Davenport, who had been formerly his father's guide in that rugged region. There he remained a week, for the double purpose of resting and conversing with him about his father, who, shortly after, on the inhospitable coast of Madagascar, died a victim to the climate and to his zeal for the progress of science. Michaux reached Charleston on the 18th of October.

Such was François André Michaux's exploring journey to the western States, of which he published a very detailed account, two years afterwards, in a work entitled "*Voyage à l'Ouest des Monts Alleghany, &c. &c.*" During this journey he did not merely devote his attention to botanical pursuits, but, with his usual habits of observation and extraordinary sagacity of mind, he diligently inquired into the state and modes of agriculture, the nature of the different soils, their particular vegetable productions, and the commercial relations existing between those remote regions and the Atlantic cities. He always felt pleasure in relating the episodes of this long and toilsome journey through regions then but thinly settled, and still the abode of the roving Indian tribes.

He spoke with enthusiasm and in terms of unreserved gratitude of attentions of which he was the object: his name was a passport which insured to him a most hearty welcome, and every assistance from those who had known his father, and had received from him seeds for planting or instructions in farming. To the new settlers he was always provided with letters of introduction, which procured him the same good reception.

[TO BE CONCLUDED NEXT MONTH.]

HOW PLANTS GROW.

BY PROFESSOR ASA GRAY, CAMBRIDGE, MASS.

[We have already given the highest commendation in our power to Professor Asa Gray's most luminous rudimentary work on botany, just issued by Ivison & Phinney, New York, the title of which is *First Lessons in Botany and Vegetable Physiology;* but being anxious to enlist in its favor the whole of our readers, and through their influence to endeavor to have it introduced into schools and colleges, we applied to the author for permission to copy one of the chapters. For that purpose we selected the Twenty-Second Lesson ("How Plants Grow"), and present the necessary cuts to illustrate this interesting topic, the theory of which is so lately adopted by the scientific world as to be taught only in books of the last quarter of a century.]

"380. A plant grows from the seed, and from a tiny embryo like that of the Maple (Fig. 1), becomes perhaps a large tree, producing every year a crop of seeds, to grow in their turn in the same way. But *how* does the plant grow? A little seedling, weighing only two or three grains, often doubles its weight every week of its early growth, and in time may develop into a huge bulk, of many tons' weight of vegetable matter. How is this done? What is vegetable matter? Where did it all come from? And by what means is it increased and accumulated in plants? Such questions as these will now naturally arise in any inquiring mind; and we must try to answer them.

Fig. 1.

Germinating embryo of a Maple.

"381. Growth *is the increase of a living thing in size and substance.* It appears so natural to us that plants and animals should grow, that people rarely think of it as requiring any explanation. They say that a thing is so because it grew so. Still, we wish to know how the growth takes place.

"382. Now, in the foregoing Lessons, we explained the whole structure of the plant, with all its organs, by beginning with the seedling plantlet, and following it onward in its development through the whole course of vegetation. So, in attempting to learn how this growth took place, it will be best to adopt the same plan, and to commence with the commencement—that is, with the first formation of a plant. This may seem not so easy, because we have to begin with parts too small to be seen without a good microscope, and requiring much skill to dissect and exhibit. But it is by no means difficult to describe them; and with the aid of a few figures, we may hope to make the whole matter clear.

"383. The embryo in the ripe seed, is already a plant in miniature, as we have learned in the Second, Third, and Twenty-First Lessons. It is already provided with stem and leaves. To learn how the plant began, therefore, we must go back to an earlier period still; namely, to the formation and

"384. Growth of the Embryo itself. For this purpose, we examine the ovule in the pistil of the flower. During, or soon after blossoming, a cavity appears in the kernel or nucleus of the ovule, lined with a delicate membrane, and so forming a closed sac, named the *embryo-sac.* In this sac or cavity, at its upper end (viz. at the end next the orifice of the ovule), appears a roundish little *vesicle* or bladder-like body, perhaps less than one thousandth of an inch in diameter. This is the embryo, or rudimentary new plant, at its very beginning. But this

vesicle never becomes anything more than a grain of soft pulp, unless the ovule has been acted upon by the pollen.

"385. The pollen which falls upon the stigma, grows there in a peculiar way: its delicate inner coat extends into a tube (the pollen-tube), which sinks into the loose tissue of the stigma and the interior of the style, something as the root of a seedling sinks into the loose soil, reaches the cavity of the ovary, and at length penetrates the orifices of an ovule. The point of the pollen-tube reaches the surface of the embryo-sac, and in some unexplained way causes a particle of soft, pulpy, or mucilaginous matter (Fig. 2) to form a membranous coat, and to expand into a vesicle, which is the germ of the embryo.

Fig. 2.

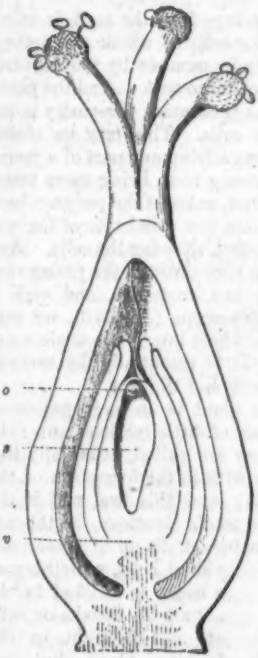


Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

"386. This vesicle (shown detached and more magnified in Fig. 3) is a specimen of what botanists call a *cell*. Its wall of very delicate membrane incloses a mucila-

Fig. 7. Fig. 8. Fig. 9. Fig. 10.

Fig. 2.—Magnified pistil of Buckwheat; the ovary and ovule divided lengthwise: some pollen on the stigmas, one grain distinctly showing its tube, which penetrates the style, reappears in the cavity of the ovary, enters the mouth of the ovule (*o*), and reaches the surface of the embryo-sac (*s*), near the embryonal vesicle (*v*).
Fig. 3.—Vesicle or first cell of the embryo, with a portion of the summit of the embryo-sac, detached.
Fig. 4.—Same, more advanced, divided into two cells.
Fig. 5.—Same, a little further advanced, consisting of three cells.
Fig. 6.—Same, still more advanced, consisting of a little mass of young cells.
Fig. 7.—Forming embryo of Buckwheat, moderately magnified, showing a nick at the end where the cotyledons are to be.
Fig. 8.—Same, more advanced in growth.
Fig. 9.—Same, still further advanced.
Fig. 10.—The completed embryo, displayed and straightened out; the same as shown in a section when folded together.

ginous liquid, in which there are often some minute grains, and commonly a larger soft mass (called its *nucleus*).

"387. Growth takes place by this vesicle or cell, after enlarging to a certain size, dividing by the formation of a cross partition into two such cells, cohering

together (Fig. 4); one of these into two more (Fig. 5); and these repeating the process by partitions formed in both directions (Fig. 6); forming a cluster or mass of cells, essentially like the first, and all proceeding from it. After increasing in number for some time in this way, and by a continuation of the same process, the embryo begins to shape itself; the upper end forms the radicle or root-end, while the other end shows a notch between two lobes (Fig. 7); these lobes become the cotyledons or seed-leaves, and the embryo, as it exists in the seed, is at length completed (Fig. 10).

"388. The GROWTH OF THE PLANTLET when it springs from the seed, is only a continuation of the same process. The bladder-like cells of which the embryo consists, multiply in number by the repeated division of each cell into two. And the plantlet is merely the aggregation of a vastly larger number of these cells. This may be clearly ascertained by magnifying any part of a young plantlet. The young root, being more transparent than the rest, answers the purpose best. Figs. 11 and 12 are two small bits of the surface highly magnified, showing the cells. And if we make a thin slice through the young root both lengthwise and crosswise, and view it under a good microscope (Fig. 13), we may perceive that the whole interior is made up of just such cells. It is essentially the same in the full-grown herb and the tree.

Fig. 11. Fig. 12.

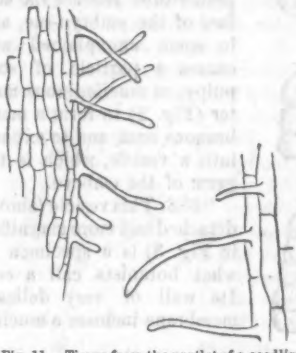


Fig. 11.—Tissue from the rootlet of a seedling Maple, magnified, showing root-hairs.
Fig. 12.—A small portion, more magnified.

"389. So the plant is an aggregation of countless millions of little vesicles, or cells (Fig. 13), as they are called, essentially like the cell it began with in the formation of the embryo (Fig. 3); and this first cell is the foundation of the whole structure, or the ancestor of all the rest. And a plant is a kind of structure, built up of these individual cells, something as a house is built of bricks—only the bricks or cells are not brought to the forming plant, but are made in it and by it; or, to give a better comparison, the plant is constructed much as a honeycomb is built up of cells—only the plant constructs itself, and shapes its own materials into fitting forms.

Fig. 13. Fig. 14.

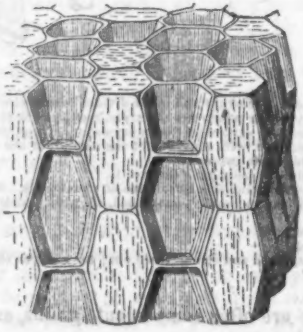


Fig. 13.—One cell, like these of Fig. 14, detached.
Fig. 14.—View of a little cellular tissue of a rootlet, cut crosswise and lengthwise.

"390. And vegetable growth consists of two things: 1st, the expansion of each cell until it gets its full size (which is commonly not more than $\frac{1}{100}$ of an inch in diameter);

and 2d, the multiplication of the cells in number. It is by the latter, of course, the principal increase of plants in bulk takes place."

[We trespass on the next Lesson, to make the illustration still more complete.]

"393. CELLULAR TISSUE.—The cells, as they multiply, build up the tissues or fabric of the plant, which may be likened to a wall or an edifice built of bricks, or, still better, to a honeycomb composed of ranges of cells (Fig. 14).

"394. The walls of the cells are united where they touch each other, and so the partition appears to be a simple membrane, although it is really double; as may be shown by boiling the tissue a few minutes, and then pulling the parts asunder. And in soft fruits the cells separate in ripening, although they were perfectly united into a tissue, when green, like that of Fig. 14.

"395. In that figure, the cells fit together perfectly, leaving no interstices, except a very small space at some of the corners. But in most leaves, the cells are loosely heaped together, leaving spaces or passages of all sizes; and in the leaves and stems of aquatic and marsh plants, in particular, the cells are built up into narrow partitions, which form the sides of large and regular canals or passages (as shown in Fig. 15). These passages form the holes or cavities so conspicuous on cutting across any of these plants, and which are always filled with air. They may be likened to a stack of chimneys, built up of cells in place of bricks."

Fig. 15.

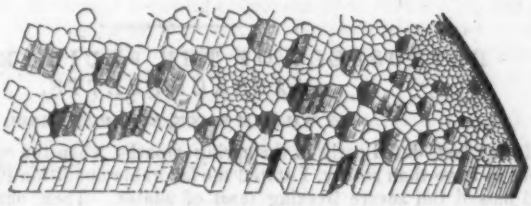


Fig. 15.—Part of a slice across the stem of the Calla Æthiopica, magnified.

An ordinary size of cell is from $\frac{1}{300}$th to $\frac{1}{100}$th of an inch; so that there may generally be from twenty-seven to one hundred and twenty-five millions of cells in the compass of a cubic inch! Over twenty thousand millions of cells must be formed in a day in the flower stems of the century plant, which grow at the rate of a foot in twenty-four hours, and become about six inches in diameter.

[Could anything be more lucid or intelligible? And what is singular, it is new. Vegetable anatomy began with Malpighi and Grew, who arrived at very good views of structure, better than their successors down to forty years ago, or thereabouts. But as to production of cells, or growth by the cell, our present knowledge was opened up by Germans, and more is owing to one still living, and not old (viz: Van Mohl, of Tübingen), than to any one else. He began to publish about twenty-five years ago.

Only within the last half-dozen years, however, has it been possible to give a simple and clear account like the above of vegetable growth, all based on thoroughly verified investigations. In this we owe most to Mohl, Schleiden (and earlier, to Mirbel), not to mention a host of very recent vegetable anatomists. In England, it is principally Lindley and Henfrey who have put this knowledge into available shape for English readers; on these Dr. Gray is a decided improvement, in the clearness and brevity with which he declares the new truths.—ED.]

BOUVARDIA HOUTTEANA.*

The old Bouvardia triphylla is a well known favorite, but yet not near as common as it deserves to be. Most cultivators are well aware of its beauty and interest as a pot plant for the greenhouse or conservatory; but few know how excellently it thrives in the open air, in summer, as a border plant. The whole tribe is well adapted to this mode of culture, from B. triphylla to B. leianthe, B. longiflora, and the handsome addition we now afford our readers an illustration of, B. Houtteana. As winter blooming plants for the greenhouse, there are few things superior to the different kinds of Bouvardias, and they are all of the easiest possible culture. They are raised from cuttings of the young wood, but much more easily and rapidly by cuttings of the roots, taken off in February, planted in sandy soil, and kept for a few weeks in a moderate hotbed. The present variety is from the princely establishment of M. Louis Van Houtté, of Ghent (Belgium), and will, we are sure, soon become common.

RETROSPECT OF THE FRUIT SEASON IN MASSACHUSETTS.

BY WILLIAM BACON, RICHMOND, MASS.

In my last, dated early in the spring months, when the opening season existed more in hope than reality, I stated the favorable condition in which our fruit-trees had passed the severe freezing term of winter. Then, our hopes of a plentiful supply of all delicious fruits were high; but we "know not what a day may bring forth." In our New England climate, we cannot prescribe the bounds to the occurrence of wintry winds and merciless snow storms! The very heavy snow of April (the heaviest fall of the season) came moist, and remained upon the trees for some four or five days; in many instances it broke down branches. After this snow had passed away, our peaches presented a very different appearance from that of the first of the month; the young shoots withered as though a fire had passed over them; of course they were dead, and gave us no fruit—not even blossoms. Many of the trees proved so nearly dead as to become useless; others revived, and now present a healthful appearance to inspire new hopes, perhaps to wither in another spring storm. Now, the query is, what was the cause of this sudden change in these trees? It could not have been frost, for vegetation had not started, and the temperature was scarcely below freezing. Be this what it may, however, one thing is certain: it was the spring killed these shoots, and not the severity of winter.

The destiny of the cherry was very similar to that of the peach; many trees died, and others had the growth of last season destroyed. In both cases, the most vigorous growing trees suffered most. Do we not sometimes injure our trees by nursing them too much, and thus making them too tender? This *is not likely to be the case*, we are sure, but we have become convinced it *may be done*. No necessity, however, of cautioning the mass of cultivators on this point; for there are yet quite too many who manage their trees with the same degree of roughness as though harsh usage was the essential to a rapid and healthy growth.

Our peaches, then, were a total failure; cherries, a very moderate crop; apples (many apple-trees were broken down by the same sad, untimely snow storm), in

* See Frontispiece.

some localities, and these are in a western exposure, bore well, but, as a general thing, trees are sparsely filled; pears produce the best of any of the fore-mentioned crops, and show their power of enduring a severe winter; grape-vines are well loaded, but, like Indian corn, the fruit needs a warm turn to give them maturity.

Gooseberries.—A slovenly accident has shown us, the past season, how to avoid the mildew. A favorite seedling bush, which gave us a fair-sized, delicious fruit, had, for some three or four seasons, like its transatlantic ancestors, been subjected to mildew, by some neglect, was left to take care of itself. In consequence, the tall grass entered its claim to the soil by virtue of squatter sovereignty, and usurped not only the soil, but the sunshine! Early in August, the bush was well laden with fine fruit, untainted by its former enemy. Now, grass around a gooseberry bush is a very unpleasant, slovenly object, and the mildew is a vexatious evil; of the two, however, we prefer the grass and the gooseberries.

Since we are upon this subject, we cannot but say a commendatory word in favor of the "Mountain Seedling," a variety originated by the United Society at New Lebanon, N. Y. We have for several years had it under culture, and, in our experience, it is a firm, hardy grower, the bush attaining a large size, very healthy; an autumnal and abundant bearer, and the fruit (which is a good-sized fruit) quite eatable, good for cooking and preserves, we have never known to mildew. For every purpose, it is far superior te Houghton's Seedling, which, with us, mildews as badly as any other variety, and has long ago been excluded from the garden.

P. S.—Melons and tomatoes have been an entire failure here.

GARDEN VEGETABLES, NO. 11.—ASPARAGUS.

BY WM. CHORLTON.

This justly esteemed vegetable has been in use, in Europe, from time immemorial, and is now seen in our own markets in the greatest abundance. In some instances, the cultivation is well understood; but still, there is need of improvement. This must be acknowledged from the fact of the stalks having, in some instances, been grown over an inch in diameter, weighing more than four ounces each.

Asparagus is the ancient Greek name of this plant; it is the *Asparagus officinalis* of botanists, and has now become so much at home on this Western continent as to be fairly claimed as indigenous. Most probably, it is truly aboriginal on the steppes of Southern Russia and Poland, where it grows so abundantly (though of a diminutive size) as to constitute a considerable part of the food of the horses and oxen in those regions. It is also to be met with on the sea-shores of Britain, and other parts of Europe, though sparsely, and most likely has only become naturalized there at a more remote period than with us. The medical properties of Asparagus are not very powerful; but it is certainly an active diuretic, and of great service in obstructions of the urinary organs. This fact is now being applied to advantage by the medical profession, and a substance called *Asparagene* extracted, which is found to be a convenient director of other medicines. It is also considered to be antiscorbutic, and, no doubt, is so on the above-named principle.

There is no plant that is cultivated as a kitchen esculent that will accept of more salt without injury than this, which fact I tested somewhat extremely, some years ago. Wishing to destroy two worn-out beds that had been in bearing some ten or twelve years, and had become worthless, as an experiment, I covered them fully

half an inch thick, in the fall, with common salt, expecting certain death to follow, as it did to all the weeds; but not to the Asparagus; for *that* was so much improved as to become the best in the garden, and so remained for many seasons afterwards.

Soil and Situation.—Although Asparagus will thrive in any fertile soil with a free exposure and dry under base, it prospers best in a sandy loam well enriched with decayed vegetable matter and sea-wrack. In this it always returns the most profit with greater certainty, and is of much better quality.

Propagation.—The only advisable method of propagating is by seed. So soon as the soil is in good working order after the breaking-up of frost, prepare as much surface as may be required, by digging and pulverizing thoroughly with the spade; draw drills one inch deep, and twelve inches apart; sow the seeds thinly, one inch distant, and cover over. In two or three weeks, the young plants will begin to appear like slender threads. Be careful to remove all weeds, while yet small, throughout the summer, and give a liberal supply of water during dry weather. No further care is needed until the final planting out. With regard to the different varieties, it is contended by some that there are several, and some seedsmen sell their seed as such. True enough it is, that there have been a number of sorts, and distinct, too; but we may very much doubt, at the present time, if more than one kind is ever recognized when the seed is being gathered. More might be obtained, if care was to be used, for, like most other things, this is liable to sport; and if the seeds of any individual plant that showed better properties than the others were to be kept separate, there would be a probable improvement in the progeny. This, continued through a series of generations, would most assuredly result in greater excellence.

Planting and Preparation.—As this is a crop of a somewhat permanent character, it becomes necessary to make a good beginning, as such will be cheapest in the end. The fall is the best time to commence preparing the compost. Choose a well drained, open spot—sandy, if possible; convey to this a barrow-load of rotted barnyard manure or tree leaves, to every two square yards, and the same proportion of sea-weed, if to be had; if not, use a peck of rock salt instead; next, open a trench two feet deep at one end of the plot, and remove the soil taken out to the opposite or finishing part; spread at the bottom a layer of the dung or leaves; over this put three inches of soil from the next intended trench, then a layer of the sea-weed or salt, three inches more earth, again a covering of dung, and so on until the next trench is excavated two feet. Continue on in this way until the whole is accomplished, and, in working, leave the material as rough and open as possible; so let it remain for the winter. When the ground is in a suitable state in the spring, turn over the whole base in the opposite or sideways direction; leave it two weeks in this state, and then again repeat the operation transversely. At this time, make the top level; measure off the plot into five-feet wide parts; string a line along each; mark this with the spade, for a guide; remove the line, and throw out the soil (two feet wide, and some four inches deep) on to the beds, leaving them in a convex shape, with alley-ways between. We are now ready for preparing to plant. Along the centre of the convexity string the line again; cut a trench perpendicularly, about six inches deep; have the plants carefully taken up, with the roots entire; place each one foot apart, against the side, and spread out the rootlets in the form of a fan; press the soil against them, and let the crown be fully two inches below the surface. On both sides of this row plant another at the distance of eighteen inches, in like manner; level and finish as the work proceeds. By this arrangement, we have beds five feet wide, containing three rows of plants, eighteen inches asunder, with passages two feet

wide between, which will be convenient when gathering the crop. When all is completed, cover over two inches of rotted manure as a mulching. With regard to the area of ground required for the use of a family, it may be from ten feet wide by fifty feet long to twenty-five feet by fifty; but the latter is enough for a very large supply, and the former will, in most cases, be amply sufficient. Always accept one year plants, if they are to be had, for they will be ready for use quite as soon as those which are older, with a greater certainty of success. These plants can always be purchased at reasonable prices from the nurserymen; so that, when there is not a home supply, the deficiency can be readily made up.

After Cultivation.—Asparagus is a very hardy plant, and will bear almost any amount of frost when established; nevertheless, it is well to cut off the withered tops in the fall, and cover over a mulching of some suitable material, to keep up the fertility, for which purpose there is nothing better than a sprinkling of guano, and a thick layer of sea-weed; but when this cannot be got, the next best substitute is a dressing of salt and barnyard manure or rotted leaves. The young shoots ought not to be cut until the third year after planting, unless there has been an extraordinary luxuriance; but after this, the beds will continue to yield in abundance for twelve or fifteen years. Much, however, depends upon a good beginning, and the after yearly dressings, besides which, when it is seen that the continually rising sprouts are becoming weak from prolonged gathering, it ought to be discontinued. No exact rule can be laid down as a guide, in this respect, but generally, it may be extended to a period of two months; and remember, further, that unless all the sprouts are kept cut during this time, the roots will almost discontinue to produce more; consequently, the crop will be much reduced.

Forcing.—There is no vegetable more readily forced than Asparagus, and there are different contrivances for accomplishing the object. The most perfect mode is, to have one or more beds prepared as above, in a line with, or being a part of, the forcing department for vegetables. The covering for this may be in the form of a low double or single span house, and should be so joined together, that all the sashes can be removed during the summer season. If a regular succession be required from New Year until that in the open ground is ready, it will be necessary, in the Northern States, to have two compartments. In the earliest, heat may be applied about the 1st of December, and in the second, the beginning of February. Of course it is understood here that a common flue, or hotwater pipes, will be needful, and as none but those having large establishments will adopt such a plan, it is expected that a proficient designer would superintend the erection. I may say, however, that the house figured in the January *Horticulturist* (art. Cucumber), would be most suitable. Another method is as follows: Excavate a space six feet wide, two feet six inches deep, and as long as may be desired; build up the sides with bricks or stone; erect another wall ("pigeon-hole" fashion) three feet away from the first, so as to leave a cavity of two feet six inches all around, and between the two. There will now be a space of three feet wide in the centre. Fill this up with (first) six inches broken bricks or loose stones; over which, cover with inverted grass turfs, and the remaining two feet with suitable material for the plants to grow in; plant out in the same way as open ground culture. In two or three years, the plants will be strong enough to force; and when such process is intended, place over the bed a double span, close-boarding frame, one foot high on the sides; fill in the cavity above mentioned with unfermented, but hot stable manure; bank this up to the sides of the frame, and as it sinks down, add more, so as to keep up the warmth. When the winter milds off, the covering may be removed, and the shoots allowed to grow. So far, I have only spoken of permanent construction, without regard to expense; but we can go much more cheaply to work, and

in a way that will be more generally acceptable, the only drawback being the destruction of the roots afterwards, which, in the other methods, is not the case. In this example, immediately before the frost sets in, dig up a sufficient quantity of strong bearing roots, and cover them with earth, in a cool cellar, to be ready when wanted; or, otherwise, put over the bed enough litter to prevent the ground freezing. As light is not required to develop the sprouts, the roots may be planted in earth, the crowns being covered two inches, and as close together as they can be packed, in a warm cellar, or under the stage of a greenhouse, where a night temperature of 50° to 60° is maintained, which is most suitable for all purposes in forcing this plant. About fifty roots will give a good dish every three days during four weeks—after which, they become exhausted, and of no further use; consequently, another lot will have to be coming on to meet the deficiency. And it may be further calculated, with the above warmth, that three to four weeks' time will bring the shoots long enough to be cut. If there be not any other convenience, a common hotbed and box frame will answer the purpose, the making of which has been described in former articles of this series. Care, however, should be exercised as to the bottom heat; for, if too strong, the roots will be scalded, or forced up weakly. Before planting, in this case, cover the surface with turf sod, and pack the roots close, as above stated. When the shoots begin to appear, give as good a supply of fresh air as the state of the weather will admit of, but do not let the thermometer sink below 45°, nor rise higher than 60°.

In the cutting of Asparagus, it has become a common practice to insert the knife below the surface of the ground. So general is this, that it would scarcely sell in the market, unless the lower ends of the shoots were white. Now, the whole of this underground part is tough and stringy, and nothing but fashion's prejudice can tolerate the unnecessary act.

FRUIT GROWERS' SOCIETY OF WESTERN NEW YORK.

FROM THE COUNTRY GENTLEMAN.

THE autumnal meeting of this Society was held in September. We give a condensed account of the proceedings, embracing the more interesting facts stated in the discussions.

Leaf Blight and Cracking in the Pear.—Members generally had found these two maladies to go together, but not invariably. The leaf-blight more frequently attacked young plants in the seed bed, and sometimes larger orchard trees. When on bearing trees, it always produced cracking; but the fruit was often known to crack while the trees were unaffected with leaf blight and in the thriftiest state of growth. L. E. Berkmans informed the meeting that the leaf blight in Belgium was unknown, while cracking of the fruit was frequent; but the climate was so moist, that twenty days in a summer without rain, would be called a dry one. Other members had observed cracking caused exclusively by wet weather.

Cracking seemed in many cases to depend on the soil, and an instance was mentioned where trees of the Virgalieu, on the grounds of T. G. Yeomans, of Wayne County, where the fruit of this variety is always ruined by cracking, were removed to the grounds of a neighbor, and afterwards bore fair and excellent fruit. But the disease could not be caused by *exhaustion* of the soil, several instances being mentioned where it had occurred on young trees, on new soil, and in one case the first crop, out of nine or ten, was the only one affected.

As it had been found that young seedlings once affected, were more apt to be troubled with leaf blight the following year, the opinion was entertained that it was a very small fungus, whose extremely minute seed were carried through the sap-pores to all parts of the plant, and were ready to germinate and develop themselves whenever the wet weather favored their growth on the surface of the leaves. It had been proved that the seed of the little fungus that produces rust in wheat, were carried from the grain or seed up the stalk in the sap, these seed being immeasurably smaller than the pores; and it was in accordance with analogy to suppose that the leaf blight was similarly propagated.

Among the sorts of pear not liable to cracking, were named the Ananas d'Ete, Flemish Beauty, Beurré d'Amalis, Bartlett, and others.

Trees on New Soils.—The question was discussed whether trees grown on soils which had been previously occupied with trees, and enriched by manuring, was as good as those on new soils, or those previously occupied with farm crops merely. The members generally had found a second crop of nursery trees from the same land, inferior to the first, even with considerable manuring, unless some years of "rest" intervened, which period appeared to vary with the natural strength of the soil from two to eight years. *Rotation* in tree crops was found important as well as in farming; for example, it was stated by T. C. Maxwell, of Geneva, that he grew cherry seedlings on land one-half of which was previously used for dwarf pears, and the other half for cherries. The cherries after the cherries, were only one-half as large as after dwarf pears. He had grown fine cherries after a crop of peach-trees. Some of the members, and especially P. Barry, thought that trees raised on manured old ground were not so healthy as those on new soil, the latter affording fibrous roots in abundance, while on old soils made rich with manure, the roots are thick, forky, and few in number.

Dwarf Pears for Orchard Culture.—Many interesting statements were made on this subject. Several very striking proofs were furnished of the profits of dwarf orchards. T. G. Yeomans, of Walworth, Wayne County, had large plantations of dwarf trees. They were eight feet apart each way, and were cultivated by two horses walking abreast, quite as perfectly as could be done in a garden by hand, and at less expense than the culture of corn and potatoes. His trees are about eight years old. His Angoulemes bear now about a bushel per tree, and sell readily for fifteen dollars per barrel. Many of the pears weigh about a pound. A member stated that he had, that morning, measured and estimated half an acre of dwarf Virgalieus on Ellwanger & Barry's grounds, and found that 120 bushels per acre would be below the actual product this unfavorable year, the price being $3 per bushel at least. The trees are but six years from the bud. Last year the crop was about the same; the year before, or when but four years from the bud, they yielded at the rate of $500 per acre. They had a row of the Louise Bonne of Jersey, eight years old, that at the same rate per acre, would yield 500 bushels, and they readily sell at $3 per bushel. The cultivation is not more costly than that of a cornfield. W. P. Townsend, of Lockport, who has had much experience, made the following statement on this subject: Seven years since, he commenced raising trees. A quantity of quince stocks were imported, and set in the usual manner, in nursery rows, and budded with pears. At the age of one year, one-half the pear-trees were dug out. He then determined to leave the balance in such a manner that the ground might be occupied by a pear orchard, which was done by removing *two* rows and leaving *one*, which made the distance ten feet between the rows. The rows thus left were thinned out so that they stood three or four feet apart. At the distance of twenty feet in each alternate row, a standard pear-tree was planted, so that the ground was cut up

into squares of ten feet, which I think is the proper distance for a dwarf and standard pear orchard. The dwarf trees on this plot are now five years from the bud. The land occupied by these trees is about one acre. The product this year (eleven barrels Bartlett) sold for $10 per barrel, and by estimate, the balance of the crop will be thirty barrels, which is sold at the same price. These same trees, in 1855, yielded eighteen barrels; in 1856, but a small crop. The varieties are Bartlett, White Doyenné, Le Cure, Louise Bonne de Jersey, and Duchesse d'Angouleme, with a number of varieties planted as specimen trees. Mr. T. had not the least doubt but the culture of pears upon quince could be made profitable. But the planter of dwarf trees could not expect a return without at least giving his trees as good tillage as he does his potato field; and the course taken by most planters has been quite the contrary, which has in a great measure been the cause of the prejudice against the planting of the pear on quince. There is not the least question but that the planting of trees and their cultivation can be profitably made to replace the loss of the wheat crop; nor is there any cause to fear over production, so long as the western portion of our land is open to us as a market.

It was generally conceded that the cause of failure in dwarf pear culture, was owing to a bad selection of sorts, and to the almost universal neglect of cultivation, planters generally not giving their trees anything like the attention they do their common farm crops.

The proper depth for planting dwarfs was discussed, and it was the general opinion that it was best to have the point of union about even with the surface of the ground. If much deeper, the pear would throw out roots, which experience had always shown made bad trees; the roots being few and one sided, the trees grow obliquely. Bending the newly formed roots around the tree, partially obviates this difficulty. If the quince is above ground, the borer is apt to attack it.

Best Form for the Standard Pear.—The general opinion was, there should not be a tall, naked stem, liable to injury by exposure to the sun's rays. Some members preferred a short trunk, some two feet high; others would allow the branches down to the ground. The objection that low branches prevented cultivation, was shown to be erroneous, by the fact that the great mass of the roots extended far beyond the spread of the limbs.

The best Age for Nursery Trees.—Many striking facts were stated, showing that the common eagerness for *large* trees to set out for orchards, was a very mistaken one, two and three years from the graft or bud being as old as was profitable in any case. In many cases, large and small trees had been set out side by side, and in three or four years the small ones had always outstripped the others.

Raspberry and Blackberry.—The following interesting facts were given by different cultivators present:—

Charles Downing said that the variety known as the Hudson River Antwerp, was the only sort cultivated largely for the New York market. The product was from $300 to $800 per acre. Sold, at wholesale, at ten cents a basket, and three baskets made a quart.

H. E. Hooker, at ten cents a quart, found the yield here to be about $140 per acre. Had taken correct account of one bed containing sixteen rods—one-tenth of an acre, and containing one hundred and thirty-six hills four feet apart each way. The product was two hundred quarts, which, at 12½ cents per quart, would be $25. Charging the cost of picking and marketing, manure and cultivation, and cost of plants, use of land, &c., at fair prices, there was left a clear profit of fourteen dollars and eight cents on this small piece of land.

C. L. Hoag, of Lockport, sold over one hundred quarts, this season, at sixteen

cents. Brincklé's Orange is not only the best fruit, but bears altogether the best crop. He did not think it firm enough to bear carriage a great distance. The plant is hardy, though he found that when covered in winter a better crop is produced, and finer. The Hudson River Antwerp killed back unless covered.

Nathaniel Draper, of Rochester, had grown the Red and Yellow Antwerp on the same soil for twenty-five years. Used no manure during the time, but kept the weeds down, and the canes tied to stakes. Never lost a crop, but plants taken from his beds and planted in highly manured soils, have proved barren. Others had observed that high manuring had resulted in strong growth and unproductiveness.

P. Barry thought that raspberries might be raised for six cents a quart at a good profit.

The following remarks on the management of the blackberry, were made by C. P. Bissell, who has many thousand plants under cultivation: The young plants should have good roots. The first season, the branches spread on the ground; the second and third years throw up strong shoots. Should be planted in rows some eight feet apart, and about the same distance in the rows. For training, the best way is to set posts, and run two wires from post to post, to which the bearing canes should be tied. In the spring, cut the canes back to about five feet, and also shorten the laterals to five or six buds, or they become so heavy with the weight of fruit as to break from the cane. The blackberry fills a vacancy between raspberries and peaches. Had picked over four hundred berries from one plant. After bearing is over, the canes may be untied from the wires, and allowed to fall by their own weight. When fully ripe, the fruit was good, but persons often picked it before ripe.

P. Barry thought the High Bush or Dorchester Blackberry better and more valuable than the New Rochelle.

Charles Downing thought the former the best flavored, but it was not so large nor productive as the New Rochelle. The Newman was sweeter than either, but not very productive.

It was resolved, unanimously, to adopt the name *New Rochelle* for the variety known by this appellation, instead of *Lawton*.

Select Lists of Market Fruits.—A very valuable result was obtained, by each member preparing, in the form of a ballot, a list of the twelve best pears, twelve best apples, and six best peaches, exclusively for marketing. Twenty-one votes were given, and the following list shows the number received for each, omitting all those that received but one vote. There were fewer ballots given for the peaches:—

Pears.

Bartlett	19	Theodore Van Mons	4
Louise Bonne de Jersey	18	Glout Morceau	3
Duchess d'Angouleme	18	Beurré Superfin	3
White Doyenne	17	Urbaniste	3
Easter Beurré	16	Bloodgood	3
Lawrence	16	Brandywine	3
Seckel	12	Beurré Giffard	3
Vicar of Winkfield	13	Beurré Clairgeau	2
Flemish Beauty	11	Beurré Bosc	2
Beurré de Anjou	9	Onondaga	2
Beurré Diel	8	Rostiezer	2
Tyson	8	Stevens' Genesee	2
Sheldon	6	Osband's Summer	2
Buffum	5	Ananas d'Ete	2
Belle Lucrative	5		

Apples.

R. I. Greening	19	Golden Sweet	6
Baldwin	18	Gravenstein	6
Roxbury Russet	17	Golden Russet	4
Red Astrachan	14	Yellow Bellflower	4
King of Tompkins County	13	Swaar	3
Talman Sweet	13	Jonathan	3
Northern Spy	12	Rambo	3
Esopus Spitzenburg	12	Seek-no-Further	3
Fall Pippin	9	Duchess of Oldenburgh	2
Sweet Bough	8	Peck's Pleasant	2
Primate	7	Porter	2
Cayuga Red Streak	7	American Summer Permain	2
Early Harvest	6	Vandevere	2

Peaches.

Crawford's Early	15	Old Mixon Cling	2
Crawford's Late	13	George 4th	2
Old Mixon Free	10	Early Purple	2
Early York	9	White Imperial	2
Morris White	5	Red Cheek Melacoton	2
Cooledge's Favorite	4	Smock's Freestone	5
Large Early York	4	Walter's Early	2
Honest John	3		

NEW PEARS.

BY L. B.

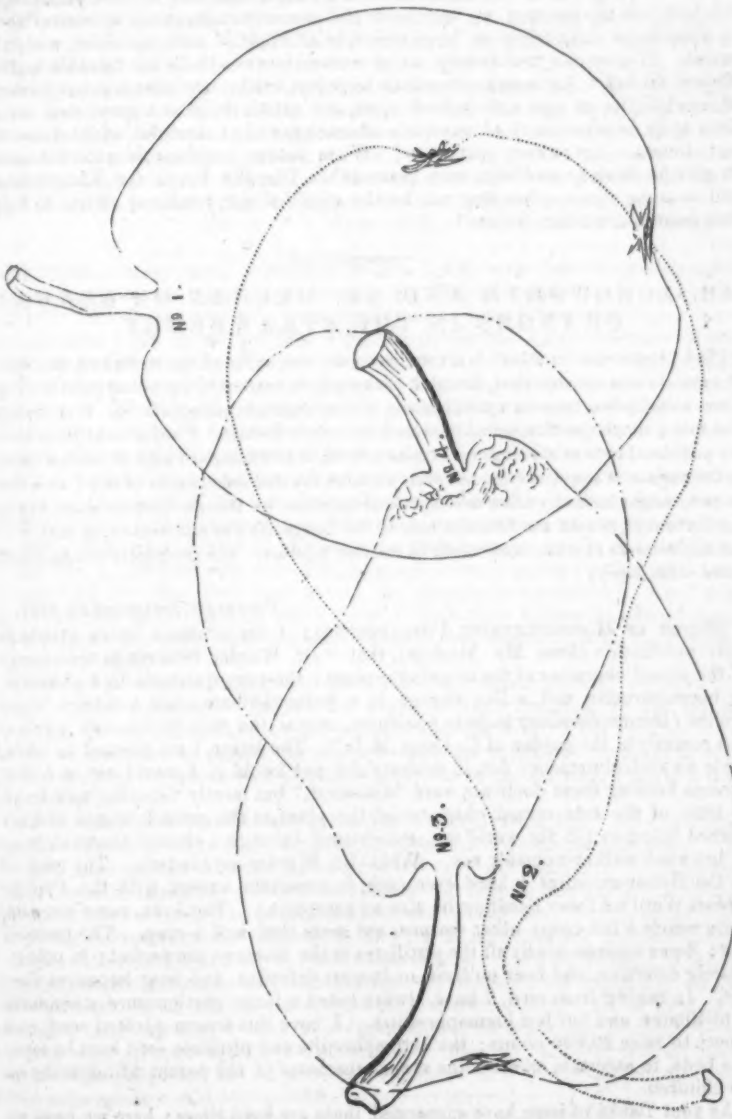
We present the readers of the *Horticulturist* with outlines of some new French Pears with high-sounding names, from a valued correspondent in Belgium; but we do so with a caution attached. It may save our friends from imposition.

No. 1, *Général de Lourmel.*—Large, round; dark green, spotted and *waved* with dull red and brown. Seedling, 1847; produced in 1853—good quality. November. Comice of Angers.

No. 2, *Général Bosquet* (Flon grolleau).—Light green; slightly spotted with red. End of September. Second quality. Seedling, 1845; production 1853.

No. 3, *Maréchal Pellisier* (Flon, Ainé).—Light, olive green, with dull red on the sunny side. End of September. Second quality. Sown in 1845; produced in 1853.

No. 4, *Lieutenant Poidevin.*—Yellowish-green, spotted with red and brown. Seedling of 1845; productive in 1853. Second quality. March to April. (Perhaps the most valuable, being *late.*) (Flon grolleau.) How pears of second, and only *good* quality *in September*, when we are in the enjoyment of a host of delicious pears, can be admitted in catalogues on the faith of their high-sounding names, and large sizes, seems to us somewhat surprising. They are nearly all very new, and of course will be unsteady till their standard value be settled or *sealed* by some years of cultivation. It is possible that some may improve in quality; but our experience with foreign pears has made us acquainted with a circumstance which leaves us little hope of such a result. Pears of second quality, or deficient in high, juicy, buttery, and sugary characters, in their native transatlantic countries, are uniformly of *third* quality in this climate; while rich and *generous* fruits, as the *Lucrative, Flemish Beauty, Beurré D'Anjou*, &c. &c., are perhaps better, or, at least, as delicate and rich here as in England or Belgium—as good as in the South of France.



No. 1. Général de Lourmel.
No. 2. Général Bosquet.
No. 3. Maréchal Pelissier.
No. 4. Lieutenant Poidevin.

We would not deter our amateurs from giving these, and all new varieties, a fair test; on the contrary, we have room and means enough, in our extensive land, to allow us to make trials on large scales, in all kinds of soils, localities, and climates. If only one new variety out of a score, proves to be as valuable as the *Beurré D'Anjou*, for instance, we shall have lost neither our time nor our money. Meanwhile, let us *sow*, and depend upon our native varieties a great deal more than upon *immigrants* of an uncertain character, and of doubtful adaptedness to our climate. *Let us sow*, gentlemen! When nature has done so much for us as to give us, in stray seedlings, such pears as the Dix, the Tyson, the Kingsessing, and *so many* others, what may not be the result of our combined efforts to help that bountiful mother, Nature?

MR. LONGWORTH AND MR. MEEHAN ON SEXUAL CHANGES IN THE STRAWBERRY.

[The "strawberry question" is a very important one, so far as the credit and character of a nurseryman are concerned, though it has very little bearing, in a practical point of view, where a distinction between a pistillate and hermaphrodite is quite material. It is strange that such a simple question cannot be at once and forever decided. If any of our friends have any additional facts or observations to record, we shall be willing and glad to publish them. In the absence of any new facts, however, we think the discussion ought to stop; and, that no party might have any cause to complain of injustice, we thought proper, before applying the brakes, to send the following note of Mr. Longworth's to Mr. Meehan, so that, if he had any remarks to make, they might be inserted together. The two papers will be found below.—Ed. Hort.]

Cincinnati, September 26, 1857.

Editor of Horticulturist, Philadelphia: I am informed by an article in your publication (from Mr. Meehan), that "Dr. Warder believes in the change of the sexual character of the strawberry plant: the pure staminate to a pistillate, or hermaphrodite, and a like change in a pure pistillate; and a change in my prolific (Hermaphrodite) to pure pistillates, as was the case in his own garden, and recently in the garden of C. Legg, M. D." The latter, I am pleased to learn, made no such statement; for, if modesty did not forbid it, I would say, not that persons holding these doctrines were "dishonest," but merely "stupid," and know as little of the true sexual character of the plant as the great Linnæus and his learned followers till the world was enlightened through a chance observation of an ignorant market-woman's son. What Dr. Warder says is true. The crop of all the Hermaphrodites I have ever seen, is uncertain, except with the Prolific (unless Ward's Albany Seedling be also an exception). The Iowa, some seasons, bears nearly a full crop; other seasons, not more than half a crop. The cause is this: Some seasons, nearly all the pistillates in the blossoms are perfect; in others, entirely defective, and bear no fruit, or in part defective, and bear imperfect berries. In raising from seed, I have always found a large portion pure staminates or pistillates, and but few hermaphrodites. I have this season planted seed, and expect to raise 20,000 plants; the hermaphrodite and pistillate seed kept in separate beds, to ascertain whether the sexual character of the parent will operate on the children.

As your Banks of issue have suspended, these are hard times; here we have no Banks of issue to suspend. In seven years, I have seen but four Cincinnati bank notes. Hard as times are, I will present Mr. Meehan with a handsome silver

goblet as soon as he publishes a letter from Dr. Warder, *acknowledging the corn.* I will remain quiet as soon as he gets Mr. Buist and Dr. Brincklé (his neighbors) to concur in his opinion. This he should be able to do, as he says "both Eastern cultivators and Cincinnati are of the same mind, after all." I have never heard of such an opinion from any Eastern cultivator but Mr. Downing. He published such a change in his bed of Hovey's Seedling. Unfortunately, his statement led persons to visit his garden, and they found some "bull had jumped into the pen." Unfortunately, neither Mr. Downing nor Dr. Warder noticed the stems and leaves enough to distinguish the difference. The stem and leaf of the Prolific will distinguish it from the Hovey's Seedling and McAvoy's Superior, at a distance.

Yours, truly, N. LONGWORTH.

DEAR SIR: In my paper referred to by Mr. Longworth, there is no such sentence as he appears to quote as my words. Dr. Warder's name I only used incidentally. Mr. L. has evidently been quoting from memory, and his memory has deceived him. Mr. L. will see that it was Dr. Ward that I had reference to, or, rather, the Cincinnati Horticultural Society, which seems to have adopted the doctor's views. I quoted exactly the doctor's words, which (unless we adopt Talleyrand's definition of language as "a power given to man to enable him to conceal his thoughts") acknowledges "the corn" quite sufficiently, in my poor opinion, to give me a claim, without further support, to that silver goblet.

It will surprise many who have been accustomed to hear "that any change in the sexual characters of the strawberry is utterly impossible," now to learn, from Mr. Longworth himself, that all hermaphrodites are uncertain except the Prolific, sometimes becoming nearly all pistillate, in other seasons nearly all staminate. Would Mr. L. favor us with some physiological reason why the Prolific should be exempt from the same laws that govern the changes in the others? That it is more constant in the locality which gave it birth than others introduced from other places, is no proof that it would maintain that character with the circumstances reversed.

Now that hermaphrodites are excluded from the "unchangeable," we have the question much simplified. As Mr. L. names Hovey's Seedling, we are left to infer that the pistillates alone are the patterns of immutability; but why the Iowa should be permitted to possess the power to suppress or develop its pistils at will, and the Hoveys be denied that privilege in the use of its stamens, I am at a loss to understand.

Mr. L. has never heard of any other Eastern cultivators but "Mr. Downing and Mr. Meehan," &c. Very fortunate, indeed, are these other gentlemen. If they are wise enough to profit by my example, they will remain in the same enviable state of obscurity. Whatever some of our friends may believe, I do not know. I have not asked or sought the opinions of any one. I have stated facts simply as I observed them. Messrs. A, B, C, or D, may have had reason sufficient to agree either with me or Mr. L., as the case may be. I should be sorry to follow Mr. Longworth's example, and offer to shape my course by the convictions of any third parties. With all due respect for the experience of Mr. L., or any other person, I must say that I have had opportunities of observing the strawberry under a much greater variety of circumstances than Mr. L. ever had, or some others whose judgment Mr. L. prefers to my own. If it should happen that they differ from me, it would not therefore be so very surprising.

In my opposition to Mr. Longworth's unchangeable views, I have been actuated from the first by the desire to benefit others. I had no purpose of my own to serve. I was not then a nurseryman; had not been caught in such an act of

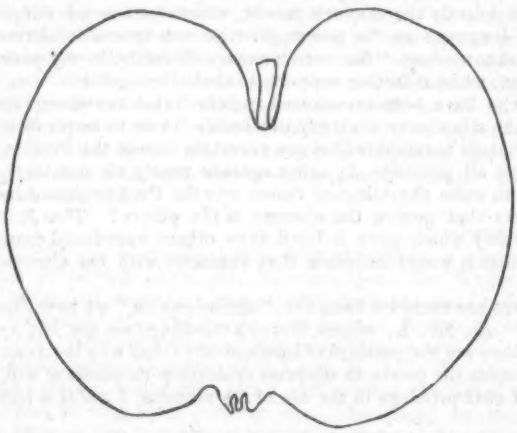
"stupidity" as Mr. L. attributes to the Clifton nursery. Feeling that, in most such cases, injustice was done to the nurserymen, and with the power which observation under rare circumstances afforded me to aid them at my command, I did not hesitate what course I had to pursue. That the time will yet come when my efforts will be appreciated, I am well convinced. THOMAS MEEHAN.

THE JACKSON APPLE.

PHILADELPHIA.

MY DEAR SIR: The apple you received from Wilson Dennis, of Applebackville, Bucks County, Pa., and which you did me the favor to leave with me, I recognize as the Jackson. Other specimens from Mr. Dennis, of the same apple, were handed to me for examination.

This valuable variety originated with James M. Jackson, of Quakertown, Richland Township, Bucks County, Pennsylvania. My acquaintance with it commenced in March, 1851, at which time I received specimens grown by Mr. Jackson, who very kindly forwarded to me grafts from the original tree.



The Jackson Apple.

Annexed is the pomological description I promised to send you.

Size, medium, two and one-half inches by three and one-fourth. *Form*, roundish. *Skin*, greenish-yellow, with many dark green blotches and gray dots, a few very faint red stripes scarcely perceptible, and, on the exposed side, a warm, mottled-brown blush, containing numerous white dots with a central gray speck in each. *Stem*, variable, from three-eighths to seven-eighths of an inch long by one-sixteenth thick, inserted in a deep, narrow cavity. *Calyx*, closed, set in a moderately wide, deep, and sometimes slightly plaited basin. *Core*, medium. *Seed*, gray, five-sixteenths of an inch long, three-sixteenths wide, and two-sixteenths thick. *Flesh*, greenish, fine texture, tender, juicy. *Flavor*, deliciously aromatic. *Quality*, "very good," perhaps "best." *Maturity*, from October to May.

I inclose an outline.

Very truly yours, W. D. BRINCKLE.

J. Jay Smith, Esq.

A JOG IN THE FRUIT GARDEN.

BY THE LATE A. J. DOWNING.

When the month of November comes, it is worth while to look about a little, and see how you stand in the garden and orchard. You must be a miracle of expertness if you have not failed in some crop or other, or if some tree or plant has not baffled your wits. Well, this being the case, now is the time to look about, and resolve either that you will succeed better next year, or that you will abandon that crop altogether.

So, go into your kitchen garden. If your soil is poor, or worn out and full of insects, this is the very time of all others to doctor it; and here is my prescription, which I have proved over and over again: Clear off the plot of ground to be renovated, and cover it with a good dressing of *fresh stable manure*, with the litter in it. Begin at one side of the plot, and throw up the soil into ridges, digging it about eighteen inches deep, and mixing the manure through the soil as you dig. Here let it lie all winter. The atmosphere and the frost will have a grand chance to do their best in bettering the quality of the soil itself; and the essence of the manure will not only be all taken up by the soil, but its coarseness will be broken down by the spring, so that your plot will be in the best possible order for vegetables when the swallow comes.

If you are troubled with grubs and insects in the ground (and you must be something more than a "big bug" yourself, if you are not), then you must also treat it with a dose of salt. Scatter any refuse or coarse cheap salt over the earth, before you begin to ridge it up, at the rate of a bushel to the eighth part of an acre—or eight bushels to the acre. Put on at this season, it will do no harm to anything vegetable, and will thoroughly rid you of these enterprising little gentry, that crawl out of the ground in May and June, and quietly play Guy Fawkes to the roots and stems of the tenderest things that the pot boils. Besides, leaving out of sight the virtue of salt as a manure, it helps all *dry* soils amazingly, giving them greater attraction for moisture, and greater power to hold it in dry weather; and that is no mean thing for a crop that gets thirsty in mid-summer.

In the review of your forces at this season, before they go into winter quarters, it is ten to one but you will find, staring you in the face—possibly not ten paces from your door-steps—some excellent old friends, whose acquaintance you begin to be ashamed of, and are sorely tempted to cut at once. I mean some good old *fruit trees*, still very sound and healthy, but utterly refusing, for years past, to bear any good fruit. Possibly they are Virgalieu or Butter Pears, Pippin or Pearmain Apples, whose good name is a thing handed down to you by your ancestors; and you are therefore not a little sorry to *cut* them. Don't do it. Let us have a little talk over these trees.

Did they ever bear good fruit in this soil? "Bless you, yes!—such fair golden skins, and luscious, melting flesh, as I seldom see now-a-days." How long ago is it that they have stopped bearing such fruit? "Say a dozen or fifteen years." What have you done for them? "Not much—scraped the bark, washed it with soapsuds—spread a little compost over such as stand in the grass. Those that stand in the garden, you know, are in good rich soil; so, of course, they could not want for manure."

This is what my friend says; but I don't believe a word of it—I mean of the last part, that they "don't want for manure." If I were a "Hoosier," or a "Buckeye," I should say they don't want "anything else." Have not they the

same atmosphere to breathe, the same rain to drink, the same climate to enjoy, as when they bore the fine crops of fruit which you lament? What has changed? Nothing—absolutely nothing—but the soil.

Need I go any further to establish this? I hope not. But the soil is probably pitiably *run out*—run out, past the power alone of stable manure to bring it up again. It is run out, as the chemists say, in "lime and the phosphates." But it can be renovated, just as surely as there is manure, and, lime, and the phosphates to be had; and you may set about it now, if you please, for this is the best time in the world to begin.

Now, to do this well and thoroughly will cost from two to three dollars a tree, labor and all included. An old officer of this sort, that has been off duty and on half pay for ten or fifteen years, can't be brought into active service again without squaring up old accounts somewhat; and you must make up your mind to this, or else have no further fruits from the old veterans.

Supposing we commenced with a middle-aged pear or apple-tree, with a sound constitution, which has been sulking for some time past on half pay. Now, it is all very well to say that this tree don't want animal manure. Its roots have been in the same place for twenty-five or thirty years, with only a little sprinkling of something stimulating over the tops of the soil, which the grass, indeed, has pretty much taken to itself, or a slight yearly dressing of compost (if it has stood in the garden) which the vegetables have devoured. Look at its little short-jointed shoots and unthrifty growth, and you will see that, first of all, it wants manure.

Very well. Now clear away everything in the shape of trees, shrubs, bushes, or vegetables of any kind that stand within fifteen feet of the trunk of this tree. Next, bring a good two-horse wagon-load of fresh stable manure, and trench it under as deeply as the roots will let you, and particularly *beyond* where the roots extend. It is as foolish to put manure within five or six feet of the trunk of a tree, as it would be to pour drink over the back of a thirsty man. At the *very outside of the roots*, trench the soil two feet deep, and mix the manure with it, leaving it rough and loose for the winter; for it is there—at this outside limit—that the roots will get a good living again.

But this is not the whole which is to be done. Remember that lime and the phosphates must be supplied, for it is above all these that old soils grow poor in. It would not do to put them in with the fresh manure, since they would not agree well together, but would go to decomposing one another, instead of making a succession of good dinners for the "feeders"—that is to say, the little fibres of the roots.

But next spring, as early as the soil is dry, you must apply to each large tree, manured in the fall, two bushels of ashes and a peck of plaster or gypsum, and, if it be a pear-tree, a half bushel of bone dust. If it is an apple-tree, you may substitute a peck of air-slaked lime for the plaster. Spread this evenly over the soil that was dug and manured last autumn, and mix it through the whole with a stout three-pronged fork. This will bring the soil to a good condition again; and the old tree will speedily commence making new roots, setting new fruit buds, and, the next season, begin to bear fine fruit again. And this I do not give you from theory, but from actual trial, under the most unfavorable circumstances.

I do not tell you to prune your tree, because I very much doubt the wisdom of it the first year. I would only see that the bark is clean and smooth; and give it a little more *soft soap*, if necessary, in that quarter. After the tree has begun to exhibit signs of feeling the *full pay* you have given it—say twenty months hence—then you may, if needful, prune it moderately. When, indeed, the tree is

partly decayed, or broken, or full of tangled and cross limbs, I would be a little severe with it at first, but not otherwise.

This is the season when a shrewd old digger should go over his peach and plum-trees, scrape away the earth about the bottom of the trunks, and look for that little rascal, the peach worm. If he is there, expecting that "there is a good time coming," now that he is in such comfortable winter quarters, you will know it by the gum, by which the tree always shows to its natural protector the presence of its enemy. Wherever you see this gum, take your knife, open the bark, and take out the vile grub. If he stays there a few months longer, he will completely circumnavigate the trunk; and, after he has been round the world in this manner, there are no more peaches for you. It is a matter of five minutes to a tree; and, if you grudge that pains, for rareripes, the grub will take five months at it, and get the better of you.

If you are planting fruit trees, don't be so foolish as to set "tender trees," such as apricots, nectarines, and so forth, in warm, sunny places, on the south side of walls, fences, and gardens. Such are, depend on it, the very spots to kill them—between the extra heat of mid-summer, and the constant freezing and thawings of the trunks in winter. You had better choose a west, or, if not too far northward, even a due northern exposure. The latter is much the best in the Middle States.

Never plant a tree with small roots and large top—when the roots have been made small by the spade in digging—without making the latter small also. There must be some ballast in the hold to carry so much sail on the mast, as an old salt would say; and you will gain in the health and size of the tree, three years hence, by shortening back the *ends* of the longest limbs till you have struck a fair balance between the part that collects food and the part that consumes it.

Yours, AN OLD DIGGER.

SCIENCE AND HORTICULTURE.

PEAR BLIGHT.

BY R. R. SCOTT, ROCHESTER, N. Y.

AN article in the last *Horticulturist*, by "TERRA," somewhat timidly suggests the probability of the disease known as "*Leaf blight and cracking of the Pear*," being caused by a fungus somewhat similar to the vine mildew, or *Oidium*. The writer need not be the least timid, even though his idea should conflict with the theories of our ablest American pomologists, which I admit it does. Not one of them can offer anything more plausible or as much so, as this, for which there is the highest European authority, that of "M. J. B." of the *London Gardeners' Chronicle*, also the most eminent Continental cryptogamic botanists. With such opinions on his side, he can readily dispense with the confirmations of merely practical fruit growers, whose opportunities and pursuits shut them out from the difficult and obscure field of microscopic botany. Let no sneers deter the earnest and humble inquirer from his purpose. The intelligence and powers of reasoning with which man has been endowed, urge him to persevere until the hidden and marvellous phenomena of nature hitherto unapproached by the naturalist shall be clearly defined. Man's manifest destiny and progressive spirit demand that he shall declare the truths of science in the face of all human ignorance and opposition.

This very reasonable cause has been laughed at by many known writers in this country, but this will not render it any the less true or plausible.

EDITOR'S TABLE.

THE LIFE OF FRANCOIS ANDRE MICHAUX, commenced in the present number, will be concluded in December. This memoir is interesting to Americans, as it records the history of a most useful man, and one who, by his late will, has become a benefactor to our country in a pecuniary gift, intended to benefit it. The particulars of his life had long been a mystery to most till Mr. Durand gave the particulars.

It is to be regretted that so few remarks are made regarding the Charleston and New York nurseries, which he established for the purpose of raising trees to export to France. At Charleston, the other day, we made particular inquiries respecting the one there, and one old gentleman knew the site, and spoke of the name of Michaux as one familiar to him in youth. The garden was called *Jardin du Roi*, and was sold in 1792. He was the first botanist who visited the Western States (1793); with what untiring zeal and assiduity his laborious researches were prosecuted, his journals now in Philadelphia are the evidences. The story of the explorations of our early botanists is of great interest, and will become of even greater, as time progresses.

HOW PLANTS GROW.—On other pages will be found Dr. Gray's exposition of "How Plants Grow," to which we particularly invite attention, as the result of verified science, and as of great interest to all. To employ a simple illustration of this knowledge: a few years since, men were puzzled to know how it was that grafts do not produce the same fruit as the stock—why, for instance, the root of one pear-tree may supply juices of twenty or more kinds. The discoveries of modern vegetable physiology disclose the successive growths of cells, each upon its predecessor, and each successor taking the exact character, and elaborating with the aid of its leaves, each its own peculiar juices. The improvements in the microscope have aided these researches, and we now have access to one of the great secrets of nature which our ancestors knew nothing about. Dr. Gray's illustrations have reminded us of the following lines:—

"Instinct with life, the buried seed now shoots
On earth's cold bosom its descending roots;
With what elastic arms its rising stem
Parts the twin lobes, expands the throbbing gem.
Soon in bright veins the silvery sap ascends,
And refluent blood in milky eddies bends;
Till spread in air, the leaves respiring play,
And drink the golden quintessence of the day."

VITALITY OF SEEDS.—Long since, the British Association appointed an important committee on this subject. Dr. Daubeny read their report at the last meeting, held in Dublin, in September. They state that after planting year after year all the seeds they were able to collect, they had now left but four species of plants whose seeds continued to grow. These were seeds belonging to the species Ulex, Dolichos, Malva, and Ipomea. The results are curious and interesting. We now give them for the information of our readers, and for reference. The register of every experiment was exhibited with the details kept by Mr.

Baxter of the Botanic Garden. From this register it was seen that the shortest period for which any of the seeds had retained their vitality was eight years, and the longest forty-three years. Grouping the plants according to their natural orders, the following selected will give some idea of the plants whose seeds retain their vitality longest: Gramineæ, 8 years; Liliaceæ, 10 years; Coniferæ, 12 years; Tiliaceæ, 27 years; Malvaceæ, 27 years; Leguminosæ, 43 years; Rhamnaceæ, 21 years; Boragniaceæ, 8 years; Convolvulaceæ, 14 years; Compositæ, 8 years; Myrtaceæ, 18 years; Umbelliferæ, 8 years; Cruciferæ, 8 years. It would appear that the seeds which retained their vitality longest were those which had least albumen surrounding their embryos, as the Leguminosæ; whilst those which had large quantities of albumen, as the Graminaceæ, lost their vitality soonest. Dr. Steele stated that he had planted many seeds obtained from Egyptian mummies, but always failed to obtain any indications of their vitality. Mr. Moore, of the Dublin Botanic Garden, related an instance in which he had succeeded in producing a new species of leguminous plant from seeds obtained by Mr. John Ball from a vase discovered in an Egyptian tomb. He also stated that he had picked from out of the wood of a decayed elm, at least fifty years old, seeds of laburnum, many of which had germinated when planted, and produced young trees. He had once grown a crop of young barberry trees by planting a quantity of barberry jam, which proved that the process of preparing the jam did not injure the seed. Many seeds grew the better for being placed in boiling water before they were set. Dr. Daubeny stated that seeds did not retain their vitality whilst entirely excluded from the air; that, in order to keep them well, they should be wrapped up in brown paper, or some other porous material. Mr. Archer stated that the seeds sent from China in air-tight vessels always failed to germinate. Some seeds kept much better than others. Mr. Ogilby stated that some seeds germinated the better for being kept. Mr. Nevins and Mr. Moore both confirmed this statement, and said that gardeners were in the habit of keeping cucumber and melon seeds in their pockets, in order to insure their more efficient germination.

The Northwestern Fruit Growers' Association held their semi-annual meeting in connection with the Alton Horticultural Society, late in September. By the kindness of the President (Mr. M. L. Dunlap), we have the following reports, which we are pleased to place on record. The exhibition of fruits was large and fine, though, in consequence of the fair at St. Louis, and several county fairs then in session, the attendance was not very large.

The Association was cautious in relation to recommending varieties for general cultivation, but the following will prove of interest to planters.

The Association is now merged in the Illinois State Horticultural Society.

FRUITS RECOMMENDED FOR GENERAL CULTIVATION BETWEEN THE 37TH AND 39TH PARALLELS OF LATITUDE.

Apples.—Early Harvest, Red June, Red Astrachan, Sweet Bough, Sweet June, Summer Rose, American Summer Pearmain, Ramsdell's Sweet, Golden Sweeting.

Fall Apples.—Fall Wine, Maiden's Blush, R. I. Greening, White Bellflower, Rambo, Hubbardston's Nonsuch, Buckingham, Peck's Pleasant, Prior's Red.

Winter Apples.—Red Canada, Willow Twig, Wine Sap, Raules Jenet, Newtown Pippin, Gilpin.

Crabs.—Yellow Siberian Crab.

Pears.—Doyenné d'Ete, Bartlett, St. Ghislain, White Doyenné, Fondante d'Automne, Dix, Napoleon, Beurré d'Anjou, Beurré Bosc, Beurré Brown, Henry 4th, Seckel, Stephen's Genesee, Fulton, Flemish Beauty, Urbaniste, Beurré Diel, Beurré Clairgeau, Duchess d'Angouleme, Winter Nelis, Columbia, Lawrence, Easter Beurré.

Cherries.—Gov. Wood, May Duke, Black Tartarian, Bigarreau Belle de Choisey, Early

Richmond, Belle Magnifique, Great Bigarreau, Gridley, Late Duke, Common Morello, Early May.

Plums.—Lombard, Diamond, Imperial Gage, Course's Nota Bene, Washington, Jefferson, Smith's Orleans, Lawrence, Bleeker's Gage, Reine Claude de Bavay, St. Catherine, Coe's Golden Drop, Semmiana, Damson, for drying and preserving; Wild Plum of Central Illinois, presented by L. Shaw, and called by him Chickasaw.

This list was passed over informally, by general consent—

Peaches.—Serrate Early York, Large Early York, Bergen's Yellow, Early Crawford, Old Mixon Free, George 4th, Late Crawford, Late Admirable, Druid Hill, La Grange, Columbia, Smeck, Heath.

Nectarines.—Red Roman, Elruge.

Apricots.—Peach, Musch.

Currants.—Red Dutch, White Dutch.

Raspberries.—Orange, Red Antwerp, Ohio Everbearing.

Grapes.—Catawba.

Strawberries.—Longworth's Prolific, Hovey, McAvoy's Superior.

LIST OF APPLES RECOMMENDED FOR GENERAL CULTIVATION BETWEEN THE PARALLELS OF 39 AND 41 DEGREES, IN THEIR ORDER OF RIPENING.

Apples.—Yellow June, Early Harvest, Carolina June, Keswick's Codlin, Sweet June, Summer Rose, Dana, Summer Pearmain, Golden Sweeting, Hocking, Maiden's Blush, Fall Wine, Rambo, Jonathan, Autumnal Swaar, Buckingham, Downing's Paragon (new), Fameuse, Roman Stem, White Bellflower, Early Winter Sweet, Yellow Bellflower, Swaar, Fulton, Peck's Pleasant, Sweet Nonsuch, Raule's Janet, Wine Sap, White Winter Pearmain, Newtown Pippin, Willow Twig.

Cherries.—American Heart, Knight's Early Black, Black Heart, Elton, Yellow Spanish, White Tartarian, Ox Heart, Early May.

Plums.—Yellow Magnum Bonum, Lombard, Green Gage, German Prune, Chickasaw of L. Shaw, Blue Imperatrice.

LIST OF APPLES RECOMMENDED FOR GENERAL CULTIVATION BETWEEN LATITUDES 41° AND 52° 33′, IN THE NORTHWEST.

Summer Apples.—Early Harvest, Red June, Sweet June, Early Pennock, Hocking, Keswick's Codlin.

Fall Apples.—Maiden's Blush, Fall Wine, Fameuse, Lowell, Sweet Nonsuch, Yellow Bellflower, Swaar, Wine Sap, White Winter Pearmain, Willow Twig, Talman Sweeting, Jonathan, Fulton, Ladies' Sweeting, Domine, Herefordshire Pearmain, White Pippin, Whitney's Russet, Ramsdell's Sweet, Bailey's Sweet, Minkler.

This last is an apple named by the Association, and recommended for general culture.

Ohio Pomological Society.—We have no report of the meeting of an official kind, but this being promised as forthcoming, we prefer to wait its appearance to giving an imperfect account of the proceedings, which seem to have considerable interest, if we may judge by the newspaper paragraphs.

The Agricultural Fairs throughout the land seem to have excited very great attention, the past season, and to have elicited much valuable information; indeed, all our reports indicate that the people have had "a good time," with one or two exceptions.

Hamilton (Canada) Horticultural Club.—We have a report of the meeting of this Society (E. Kelly, President), but too late for insertion.

Culture of the Pear.—The ensuing number will contain an able article on the Comparative Value of the Culture of the Pear and other Fruits, by L. B., of New Jersey, fairly written, and favorable to that delicious production. We shall then have given both sides of the question from valued correspondents, and thus leave our readers to form their own opinions from facts that may come under their own notice, no less than from the experience of good practitioners recorded in these pages.

Curculio.—A very sensible remedy for this pest is proposed in the *Ohio Valley Farmer*, by Mr. Walker, of Kentucky. As soon as the fruit is attacked, take a tin pan into which soapsuds has been placed to the depth of an inch or so; place it in the tree, and place a small glass globe lamp in the middle of the pan, which permit to burn all night. In darting towards the light, the curculios strike the glass, and are precipitated into the liquid, from which they are unable to extricate themselves.

The Old Gardeners' Book.—This very ancient work (*Lawson's*, 1626) is nearly ready for publication, in black letter, and a *fac-simile* of the curious engravings. The annexed repre-

sentation of trimming, digging, and planting, will give some idea of the book, of which we shall have more to say in December. The work, which is a great literary curiosity, will be offered for sale, as well as a premium to those who forward subscribers to the *Horticulturist*.

Gossip.—The Havanese may be compared to the Chinese, in their love of smoking. Men, women, and children, live with pipes in their mouths. The laborer smokes in the field, the clerk at his desk, the traveller on horseback. "If," says M. Huc, "a person wakes in the night, he lights his pipe." The most certain sign that a sick man is about to expire is, that he ceases to inhale the fumes of tobacco. Upon this he expends his latest breath; and the native Christians who came to summon M. Huc to administer the sacraments to the dying, always said, in proof of the desperateness of the case: "He no longer smokes."

——On volcanic rocks, bare earth, naked walls, or in pure sand, plants are found to vegetate. On the bare spots above enumerated, is deposited the vegetable mould of leaves, &c.,

and thus gradually a soil is made rich in organized matter, constantly increased in their decay; their successors live more healthfully upon the inheritance, being supported partly upon what they industriously take from the air, and partly upon the ancestral accumulation of vegetable mould. In this way, each successive generation may enrich the soil; and when it dies, it bequeaths to the soil not only all it took from it, but all that it drew from the air. It is in this manner, especially, that the humble lichens, mosses, ferns, and other plants, which short-sighted man terms useless, play an essential part in the economy of nature. They *can* live directly on the air. Their minute seeds, quite invisible to the naked eye, and, in number, far surpassing man's power of computation—light almost as the air itself—are widely scattered by the winds over mountain and plain, and lodged upon every naked rock, or stagnant pool, or tract of barren sand, where all they need is moisture, to excite and maintain their growth. Some, like the lichens, require even little of this. They attach themselves to dry rocks or plains of lava, which are washed only by the occasional shower, and here they make the earliest inroads upon barrenness. Not only do the accumulated remains fill the crevices with fertile mould, and the water, which it holds like a sponge, by its freezing and thawing, aids in the disintegration of the rock, but many of them create, from aerial elements, *oxalic acid*—a powerful solvent—which, as it is gradually set free, acts upon and excavates the stony surface to which the plant firmly adheres. Thus the dying lichen digs for itself in the solid rock a sepulchre in which its dust may rest. Well did Linnæus, in his lively fancy, term the lichens *vernaculi*, or *bond slaves*, chained, as it were, to the rocks which they labor to cover with soil for the benefit of others, though they derive from it no nourishment for themselves.——A very curious passage in natural history might be written by any one who would group together what may be called fish paradoxes. Thus there are fish that fly; fish that climb; fish that hop like frogs, using their fins as veritable legs; fish that ruminate (the carp); fish that discharge electricity in sufficient intensity to decompose water; fish that migrate; fish that make nests; fish that incubate; and fish that bring forth their young alive.——Hugh Miller says: "As another family of plants, the Rosaceæ was created in order that the gardens which it would be one of man's vocations to keep and to dress, should have their trees 'good for food, and pleasant to the taste;' so flowers, in general, were profusely produced just ere he appeared, to minister to that sense of beauty which distinguishes him from all the lower creatures, and to which he owes not a few of his most exquisite enjoyments. The poet accepted the bee as a sign of high significance; the geologist also accepts her as a sign. Her entombed remains testify to the gradual fitting-up of our earth as a place of habitation for a creature destined to seek delight for the mind and the eye as certainly as for the grosser senses, and in especial, marks the introduction of the stately forest-trees, and the arrival of delicious flowers."——The same author illustrates the wonders revealed by geology by the bones of the *Dinornus giganteus*, exhibited by Dr. Mantell, in 1850, which greatly exceeded in bulk those of the largest horse. A large thigh-bone, it was held, must have belonged to a bird that stood from eleven to twelve feet high, the extreme height of the African elephant.——"If," says the President of the British Association, in his late speech, "as is indicated by the small density of the sun, and by other circumstances, that body has not yet reached the condition of incompressibility, we have, in the future approximation of its parts, a fund of heat quite large enough to supply the wants of the human family to the end of its sojourn here. It has been calculated that an amount of condensation which would diminish the diameter of the sun by only the ten-thousandth part, would suffice to restore the heat emitted in 2,000 years."——Jewellers' gold is now alloyed (adulterated) with zinc instead of silver, and presents a fair appearance; but a galvanic action is produced upon gold so alloyed, by means of which the metal is split into separate pieces, and the articles rendered perfectly useless. Gold chains, pencil-cases, thimbles, and lockets, are the articles of which

the public will do well to take heed, as these have, among some other things, been lately so constructed in vast numbers. Ladies should know that what they wear as gold is far otherwise ——A few tablespoonfuls of brown sugar will preserve fresh fish for some days, so as to be as good, when boiled, as if just caught. If dried, and kept free from mouldiness, there seems to be no limit to their preservation, and they are much more nutritious in this way than when salted. If salt be desired, a teaspoonful or two may be added. Saltpetre may be used instead of salt, if it be wished to make the fish hard. Efforts should be made to furnish our cities with fish at less cost than is now done; they bring twice their value, for instance, in our Philadelphia markets, which are brought by railroad within two hours of the sea.——The best remedy for the nuisance of mice in a house, is to starve them. What food is carelessly left on the floors, &c., constitutes the food of mice. Remove every particle of food from floors and tables every evening, and burn it, and place all food fit for use in safes of some kind which they cannot enter, and the propagation of these troublesome little animals would nearly cease in large towns, or confine them to drains and sewers.——The lotus leaf turns water off its upper surface in a pool like quicksilver. The cause has been ascertained to be that it is covered with short, microscopic papillæ, which entangle the air, and establish an air-plate over the whole surface, with which, in reality, the water never comes into contact at all. The same phenomenon is believed to be exhibited by water-fowl, and that this is not due to the presence of grease or oil. The suggestion may be turned to account by practical men, perhaps, viz: Might not the manufacturers of water-proof cloth manage to produce a surface such as would entangle and retain a film of air while it permitted transmission of air through it?——Somebody told Jerrold that a celebrated auctioneer was dead, and, of course, his business would go to the devil. "Oh, then, he'll get it again," said the wit. "Well, my dear Jerrold," said a tedious old gentleman, "what is going on?" "I am," quoth the questioned, and immediately shot off along the pavement.——The most magnificent specimen of Chinese Wistaria in Europe, is trained upon the walls of the London Horticultural Society, where it occupies a space three hundred and seventy-five feet in length. This plant may be forced to advantage, and is by no means to be despised as a greenhouse climber. Its recommendations are, great freedom in the production of its flowers, great beauty, and fragrance. Pruned, it may be brought into a dwarf condition, and grows well in ordinary garden earth.——It is now evident, that whatever the home of the cotton plant, primarily, it is most valuable near the northern or cold limit of its actual cultivation, from the climatological advantages there presented. As to forced Indian cultivation of cotton, there is little to be expected; the American adaptation was apparently a spontaneous result, and not the triumph of a conflict with climatological difficulties, and it appears to be wholly impossible to transplant its peculiar success. About 400,000 bales of inferior cotton, is all that has ever been received from India, in one year, after efforts spread over many years and various temperatures; its tropical climate not only injures the annual varieties, but also soon changes them to perennials.——The sub-tropical tree-forms begin to be abundant in Ohio, and, southward, they increase in number rapidly, till they become exclusively tropical in the oranges, palms, live oaks, and mangroves of the lower half of the Florida peninsula. The papaw, cypress, and gum-trees, commence in the Ohio Valley, while long-leafed pines, cypress, and live oak, appear on the Atlantic coast, at Norfolk; evergeen magnolias, palmettoes, and the wild olive, follow before reaching Savannah, and the border of the Gulf affords many constant forms equally marked as tropical. The forest of the coast at Charleston is rich with tropical forms, red and white bays, giant laurels, cabbage palms, live oaks, &c. At St. Augustine, the wild orange is added, and, in the southern part of the peninsula, satin-wood, mahogany, mangroves, the cocoa-nut, and a variety of truly tropical palms.

A fine Portrait of F. A. Michaux, engraved on steel, will ornament our December number, and form an admirable frontispiece to the year's volume.

A Portrait of Dr. Brinckle, extremely well executed in photograph, has been laid on our table. Long may the able pomologist live to benefit his race.

Indian Summer.—De Quincey, in the new edition of the *Confessions of an English Opium Eater*, has described the advent of Indian summer, in the following passage, more beautifully than any master of the English language:—

"It was a day belonging to a brief and pathetic season of farewell summer resurrection, which, under one name or other, is known almost everywhere. It is that last brief resurrection of summer in its most brilliant memorials—a resurrection that has no root in the past, nor steady hold upon the future, like the lambent and fitful gleams from an expiring lamp, mimicking what is called the 'lightning before death' in sick patients, when close upon their end. There is a feeling of the conflict that has been going on between the lingering powers of summer and the strengthening powers of winter, not unlike that which moves by antagonist forces in some deadly inflammation, hurrying forwards, through fierce struggles, into the final repose of mortification. For a time, the equilibrium has been maintained between the hostile forces; but at last, the antagonism is overthrown; the victory is accomplished for the powers that fight on the side of death. Simultaneously with the conflict, the pain of conflict has departed; and thenceforward, the gentle process of collapsing life, no longer fretted by counter-movements, slips away with holy peace into the noiseless deeps of the Infinite. So sweet, so ghostly, in its soft, golden smiles, silent as a dream, and quiet as the dying trance of a saint, faded through all its transient stages this departing day."

Ontario Pear.—We are much pleased with the appearance and qualities of the Ontario Pear, from the nurseries of W. T. & E. Smith, Geneva, N. Y. They first introduced it at the American Pomological Society of Rochester, in 1856, where it was highly approved. Size, medium. Color, a beautiful pale lemon. Of very rich, buttery, sweet, and excellent flavor. Ripens, end of September and early in October. Undoubtedly, a good market variety, which we advise planters at once to procure. There has not been, as far as we can ascertain, a bushel of as good-looking pears in the Philadelphia market, the present season.

Gapes in Chickens are said to be cured by the use of salt. The disease is a worm in the throat of the bird; if lumps of salt are left in their way, or a little box of common salt in a convenient place, the chickens will take enough of it to prevent or cure the malady. When they are very sick, and gaping piteously, the best thing to do is to spirt a little salt and water into their throats. Some use an aromatic decoction of cinnamon, pepper, &c., a drop or two of which is put into the bird's throat with excellent effect; but salt is the great vermifuge of creation. Instinct seems intended to act as a safeguard against those parasites, which, if let alone, would soon be as fatal to our own peace and comfort as those of old Timon, of Athens, were to his.

The Sewing Machine of Grover & Baker, advertised in the accompanying sheet, is spoken of by those in whom we have confidence, as doing everything it promises, and we therefore refer housekeepers, &c., to it.

What is Exhibited and Reported.—We think every one who reads the following paragraph in a New York daily paper, respecting the horticultural exhibition in that city, must have

been at least amused that the reporter should find so little else of interest to himself as to be obliged to say:—

"Among the audience, we noticed the Rev. Drs. Chapin and Osgood; also, Rev. Mr. Roach, of the Allen Street Methodist Episcopal Church, who has lately settled in this city, and has the reputation, among the members of that church, of being as polished an orator as the other two distinguished divines."

We congratulate the Rev. Mr. Roach upon his reputation, but the bathos is nevertheless peculiarly racy, equalling anything on record in horticultural reports.

PEARS.—We are indebted to Mr. Carpenter (nurseryman at New Rochelle, N. Y.) for a box of Church and Huntingdon Pears. The first is the best, and a valuable fruit; it is firm and buttery, and may be safely recommended. It is small this year, and we are assured that, in good seasons, it is double the present size. The Huntingdon has a more peculiar flavor, but is second to the Church, which, with the Ontario, are now fairly introduced. The Parsonage Pear we do not esteem as highly as the others.

PLANTS FOR HANGING BASKETS, AND STOVE CLIMBERS, ETC.—A correspondent says that the Messrs. Henderson, near London, grow extensively the following plants, in hanging baskets: "Hanging baskets were first introduced here, I believe, and now they find it a regular branch of business. All the Æschynanths they grow that way now; also Thyrsacanthus rutilans, Hoya bella, Cactus, or Epiphyllum truncatum Russellianum, and the crosses from them; Russellia juncea, which blooms in these baskets or basket-like pans, with holes in the sides and bottom, better than in pots. Campanula garganica, they force in the stove, in these baskets, where it rambles like a climber; and when it comes into bloom, it is removed to a cool house, where you would hardly know it; and so with numerous kinds down to Aaron's Beard, the Saxifraga sarmentosa.

"The best six stove plants for hanging baskets (their own selection), are Æschynanthus splendens, Hoya bella, Impatiens repens, Isolepis gracilis (also in the greenhouse, and out of doors in summer), Margravia dubia (with uncommonly fine foliage), and Torenia Asiatica.

"The best twelve stove climbers: Allamanda Aubletii (yellow); Clerodendrum splendens and speciosissimum (two or three kinds of splendens are not worth growing); Combretum purpureum; Dipladenia acuminata, crassinoda, and splendens; Hexacentris Mysorensis, Hoya imperialis, Ipomæa Horsfalliæ, Passiflora princeps, or racemosa, P. Decaisnea, and Stephanotis floribunda."

The writer continues: "The newest thing in this nursery is from an original idea—a rare thing in gardening—a thirty-paned propagating house, forty feet by thirty-five feet, which will be in three divisions, the tanks for bottom heat being the novelty. They are to be eighteen inches deep, with two flow and one return-pipe in each, and will be heated with Thomson's new retort boiler. The new idea for bottom heat is an improvement on all other modes of hot-water bottom heating. It is this: After the three pipes are proved in each tank, that tank is to be filled *on the principle of the filter*, first with big stones in the bottom, or say as large as ducks' eggs, then another layer of stones not so big; after that, a layer of very rough gravel, and another layer of gravel not so rough, and so on till the top is of the finest sand; then a foot of water is let in, and the pipes will heat the mass to 80°, more or less; and, when once that heat is got, a few hours' firing, daily, will keep it up, and a constant moist bottom heat is as certain as from a dung bed. Three inches of clean sand will keep down the vapor, and be the best way of bottom heating and plunging, and, in the autumn, the water will be withdrawn by turning a cock; and then a dry bottom heat is secured for the winter, the mass of stones and gravel retaining the heat for days and days at little cost. This is a vast improvement on the old way of throwing in steam among

stones for bottom or for more permanent heat, as was practised just at the time when the hot-water system was introduced."

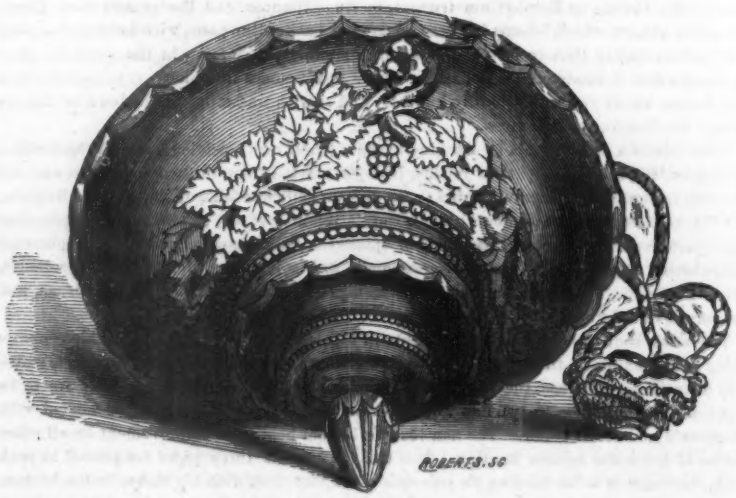
Of new plants found at Henderson's, he says: "Jasminum dianthifolium, with a slender habit and sweet, starry, white flowers, was quite new to me as a stove plant, which everybody buys for its manageable size and most deliciously sweet blossoms. Dipladenia urophylla and Allamanda Aubletii are spoken of as very superior; Ardisia hymenandra and Æschynanthus splendens, the same; Ixora floribunda, a close grower, with rosy flowers, ditto; Rogeria thyrsiflora, much after Ixora, the same; Tecoma spectabilis, Meyenia erecta, and the magnific Medinilla, with Maranta Warscewiczii, the Hexacentris, Gesnera Doncklarii, Dipladenia acuminata, Nepenthes phyllamphora, the two Sonerila margaritacea, and Impatiens Jerdoniæ, are all of the first water."

Another authority has the following interesting list:—

"*Plants for rockwork*, all with variegated leaves: Ajuga reptans, Aira cærulea (Molinia cærulea), Carex, Dactylis glomerata, Festuca glauca, Galeobdolon luteum, Glechoma hederacea, Linaria Cymbalaria, Saxifraga umbrosa, Tussilago Farfara, Vinca major elegantissima, V. major reticulata, V. minor aurea. V. minor argentea.

Plants for pot culture: Ægopodium Podagraria, with variegated leaves, free growing, and handsome; variegated Ageratum cœlestinum, Arabis lucida, with very fine bright golden

Fig. 1.

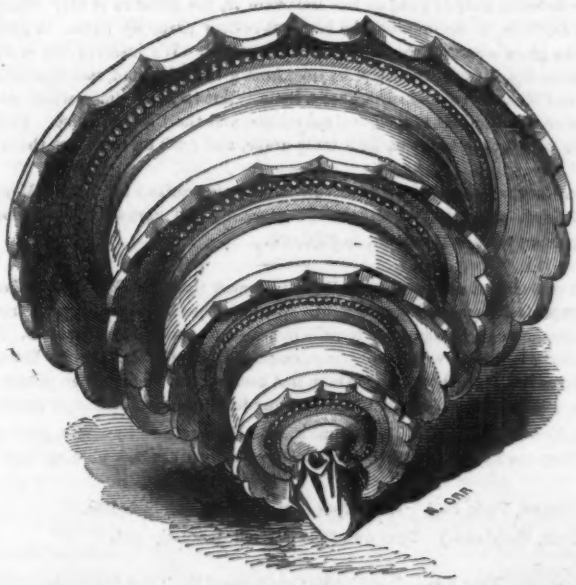


Hanging Vase.

variegation; Arundo Donax versicolor, one of the very best variegated plants; Artemisia vulgaris, handsome in a pot; Arum maculatum, with veined leaves; Aspidistra lurida variegata, generally shown as a stove plant, but quite hardy and very fine for specimen plants; Centaurea candidissima, with ornamental silvery leaves, makes a first-rate specimen plant; Cineraria maritima: this, like the preceding, is covered with down, which looks like frosted silver, an elegant plant for rooms at night; Convallaria majalis: this is even finer as a pot plant than in the border; Dactylis glomerata fol. var., a handsome Grass;

Festuca glauca, tinged with blue; Funkia albo-marginata, has a narrow white edge; F. ovata, bordered with white; F. undulata, with a broad white belt in the middle—all three

Fig. 2.



Hanging Vase.

make handsome pot plants: Melissa secunda, has leaves mottled with white, dwarf habit, and a profusion of pretty rosy flowers; Mentha rotundifolia, with white border; M. sylvestris, pretty, frequently three colored; Polemonium cæruleum, a beautiful plant for pot culture; Pulmonaria sibirica, with very distinctly spotted leaves; Spiræa ulmaria variegata, Tussilago Farfara, very beautiful as a specimen plant.

Plants for baskets or hanging vases: Glechoma hederacea, exceedingly pretty for this purpose; Linaria Cymbalaria, a diminutive plant, but remarkably pretty; Vinca major elegantissima, one of the finest variegated plants in cultivation; V. major reticulata, exceedingly elegant, the leaves looking like network; V. minor aurea and V. minor argentea.

Of many of these plants pretty specimens were shown by Mr. Salter at Regent's Park, where they were much admired. We may add that the beautiful Chinese Farfugium grande when it shall have become more common will doubtless be a great favorite both for pot culture and for rockwork."

The subject has taken strong hold of our American spirit of adorning *home*, and we are glad to lend our aid to so good a cause.

Delaware Grape.—We are indebted to George W. Campbell, Esq., of Delaware, Ohio, for samples of the Delaware Grape, which equals the description in Downing's new edition, where much of interest will be found regarding the new varieties. The Delaware is a great

acquisition. The Diana is now ripe in our garden, and comes next in our estimation to the Rebecca and Delaware. The Concord is much esteemed in the Northern and Eastern States, because it ripens early, but we do not find it equal to the Catawba in any respect.

Rebecca Grape.—After the above was written, Mr. Brocksbank, of Hudson, forwarded a box of the Rebecca Grape; good as the Delaware is, the Rebecca is very superior, and we are free to say it is, in our opinion, the best out-of-door grape we have. A good crop of it will take the place *almost* of the hothouse productions. We inserted the word "almost" after the foregoing, in consequence of having, from a valued friend, *such* specimens of Black Hamburg and Muscats as made us waver a little. But in these times, when coal and labor are expensive, the Rebecca is a *capital* substitute, and the Delaware also. From this time forward, we give up the Catawba for a table grape, and graft on the vines these two.

The Wine Crop in Illinois.—Grape culture is becoming quite a business in Monroe County, Illinois. It is estimated that the citizens of that county will market 150,000 gallons of wines, which, at present rates will amount to $200,000.

Answers to Correspondents.—A. D. W. is informed that the *Philadelphia Pear* does not equal the expectations formed regarding it. We have specimens, this season, from the original tree in Roxborough, Pa., and find it quite inferior—we should say, valueless. The *Germantown Strawberry* is a most valuable variety, originated here by Mr. George Young; and Mr. Downing gives it a high character. There has been a great demand for plants, Mr. Young informs us, and he will be prepared in the spring to fill a large number of orders.

The Des Nonnes Pears, from Thorp, Smith, and Hanchett, of Syracuse, are "very good." Whether they are identical with *Beurré de Brignais*, we are not able at this moment to decide.

(H. B. Weiser, York, Pa.) The grapes sent are very fine Isabellas.

(A. A. Hull, Maryland.) Your questions are not definitely put.

Catalogues, etc., Received.—Descriptive Catalogue of Fruit and Ornamental Trees, Shrubs, Roses, and Bedding-out Plants, cultivated and for sale by W. T. & E. Smith, Geneva, N. Y., 1857.

Catalogue des Onions, de Fleurs, et Fraisiers qui se trouvent chez Vilmorin-Andrieux et Cie. Paris, 1857.

Catalogue des Graines, de Fleurs, ditto, do.

The Lawton, or New Rochelle Blackberry, its Origin, History, Characteristics, and Culture. New York: Drew & French, 85 Broadway, N. Y.

Illustrated Annual Register of Rural Affairs for 1858. No. 4. Albany: Luther Tucker & Son. A very good manual for housekeepers in the country, and illustrated, the title enumerating "one hundred and thirty engravings."

Catalogue of Fruit and Ornamental Trees, cultivated and for sale at Schenectady, N. Y., by C. Reagles & Son. 25th edition. Rich in fruit.

Descriptive Catalogue of Fruit and Ornamental Trees and Greenhouse Plants, for sale by Thorp, Smith & Hanchett, Syracuse, N. Y. This is one of the best catalogues we have ever examined; the firm from which it comes takes its place among the first cultivators of the country. We should say, from a perusal of the catalogue, that it was reliable.

Catalogue of Fruit and Ornamental Trees and Plants, cultivated and for sale at the Lebanon Nurseries, Pittsburg, Pa., by Blackstone and Ammon. We are glad to see so good a list from our own State.

Catalogue abridged of M. Kelly and Co.'s Trees and Plants, Cincinnati, Ohio.

Robert Buist's Catalogue of Select Fruits, Philadelphia. A great and valuable list.

Catalogue of Fruit and Ornamental Trees, &c., cultivated at the Fruitland Nurseries, Augusta, Ga., by Dr. Redmond. An excellent selection.

A Descriptive Catalogue of Fruit and Ornamental Trees, Deciduous and Evergreen Trees and Shrubs, Roses, &c., cultivated and for sale at Forest Nursery, near Elkton, Todd County, Ky., by J. S. Downer & Son. If we are to judge by this catalogue, Kentucky possesses almost everything we have on the Atlantic coast.

Supplement to the Descriptive Catalogue of André Leroy's Nurseries, Angers, France, 1857.

Descriptive Catalogue of Fruit and Ornamental Trees, &c., for sale by Edwin Allen, at the New Brunswick Nurseries, N. J., for 1857–8.

Descriptive Catalogue of Select Fruit-Trees, &c. &c., for sale by Thomas & Herendeen (late J. J. Thomas), Macedon, Wayne County, N. Y.

Etablissement de Horticulture de Pele, Rue de Lourcine, Paris. Choix de Plantes nouvelle ou rare, 1857.

Calendar of Operations.

NOVEMBER.

THE VINEYARD.

BY R. BUCHANAN, CINCINNATI, OHIO.

The crop is gathered, and the vintage over, usually by the middle of October. Some cultivators hoe their vineyards in autumn, after the vintage, in preference to the spring, but the latter season is preferred by the majority for ploughing or hoeing. Late in November, when the leaves are all off, and the wood fully matured, the vines may be pruned, if cuttings are wanted for fall planting—a favorite season for setting out cuttings with many nurserymen.

Treatment of the Wine.—The fermentation will be over in about two weeks after the juice is put in the casks; then fill them up full, and drive the bungs in moderately tight. In two months (sometimes earlier), the wine will be clear, and pleasant to drink; but it should never be bottled until after the *second* fermentation, which takes place in May. In January, the wine is drawn off, and put into another cask, and the lees sent to the distillers with the pomace, to make brandy, or thrown on the manure pile. Some persons put the wine back into the same cask in which it was fermented, under the belief that it keeps better than in another.

BY WILLIAM SAUNDERS.

Vegetable Garden.—There is every reason to suppose that the potato disease which has been prevalent in many sections of the country, has been induced by the continued wet state of the soil during the early summer months. Dry weather completely checked its progress, and on dry, elevated soils it was scarcely seen. On drained lands, the disease was also comparatively unknown. Were anything wanting to establish the value of draining as the foundation of all improvement in cultivation, it has been furnished us this season. It is certainly the most economical. Draining tiles are comparatively cheap; an inch and a half or two-inch pipe is of ample capacity, except for mains. Depth is of great importance. Even in tenacious soils, the drains should be three and a half or four feet deep. At this depth, their influence extends over a greater space; consequently, fewer drains are necessary than when they are placed nearer the surface. Those who have not had experience in this matter, have but a faint idea of the increased value it confers on the soil. Perhaps the best argument in favor of draining, is the fact that those who have experimented on a small scale are profiting by experience, and extending their operations. Agricultural chemists have much to answer for in their almost total neglect of enforcing the improvement of the mechanical condition of the soil; they have dwelt too exclusively upon its chemical constituents; indeed, the physical condition of the soil is seldom connected with

the analysis of the chemist. In a former volume (1849), I took occasion to allude to this subject; more recently, we find an increased attention given it by scientific writers. So much depends upon the decomposing power of the atmosphere, that its presence or absence in a soil will materially effect its productiveness. The soil should be considered as a laboratory, in which, by the aid of air and moisture, chemical changes are constantly occurring, preparing the various kinds of plant food for admission to roots. But let the atmospheric influences be excluded, and this process is stopped; the most valuable ingredients, although present, may now remain unavailable and useless to vegetation, because not in a condition fitted for absorption. It has been proved that soils which, on analysis, have shown a sufficiency of ingredients for a crop, have proved unproductive, because these matters have not been present in an available form. Draining removes the surplus water, and allows the unimpeded access of the various gases upon which vegetable life wholly depends.

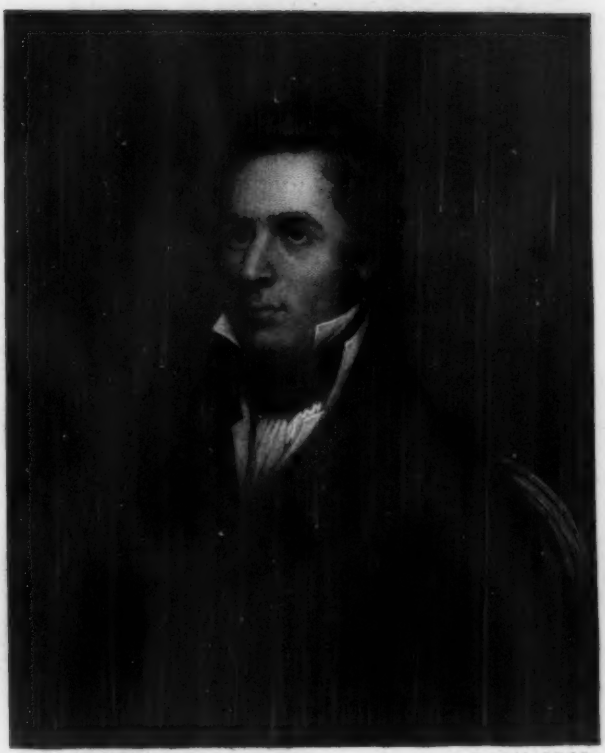
Fruit.—The cultivation of the pear-tree grafted on quince roots, is now being a subject of discussion among fruit growers; we should be sorry to see this system of dwarf culture fall into unmerited disrepute. It is a fact beyond dispute, that where a judicious selection of sorts that are adapted to this system has been made, and proper care given in culture, there has been no want of success. It is only by experiment that we can ascertain the kinds adapted to special systems of culture; and in making these experiments, failures must be expected. The list of pears that have been found to succeed on the quince stock, is sufficiently extensive for ordinary purposes of utility, and the list is yearly increasing. The Duchess d'Angouleme, Beurré Giffard, Glout Morceau, Louise Bonne de Jersey, Vicar of Winkfield, and Easter Beurré, will form a reliable collection; but no collection can be reliable unless properly cultivated. Let the ground be loose, deep, and mellow, and not saturated with manure. Plant so as to cover the quince root, whatever others may say. Mulch, both summer and winter. Prune understandingly, and success will be certain. But do not attempt to improve upon the practice of successful growers until you first learn to equal it, nor spend money on special manures, or any other *extraordinary* expedients, until you are successful under *ordinary* cultivation.

Greenhouse.—Before severe frosty weather prevents out-door operations in the ground, it will be useful to secure a quantity of soil for repotting during winter. Select a quantity of surfy sods from old meadows or pasture grounds, and pile them up under cover. All greenhouse plants will grow well in this. In former years, when vague ideas were held in regard to the relations between the soil and its vegetable products, mysterious virtues were ascribed to certain complicated mixtures of manures and composts. These mixtures are not at present held in such estimation; the intelligent florist looks upon soil as a medium for conveying nourishment, where the roots have presented to them the various gases from which they derive their principal food. To be available for the use of vegetation, soils should not only possess all the ingredients of fertility, in a chemical sense, but its physical condition (its relation to air and water) should also be of a nature to allow a free admission of air to all its parts, and be favorable to the extension and ramification of roots. Fibry soil, such as is derived from decomposed sods, presents all these conditions in an eminent degree. The vegetable matter in which they abound insures porosity, and, as it gradually decays, a constant supply of food is liberated in the immediate vicinity of the roots. The principal care required in the general management at this time, is to guard against excitement. Air may be given freely, and watering must be cautiously conducted. Discriminate between those plants that have completed their growth, and now require a season of rest, and those that are still growing or coming into flower. The latter will require a more constant supply of water than the former. There is no operation in the management of plants in pots that demands more judgment than supplying them judiciously with water; and so varied are their requirements of this element, that no definite rules can be given to be universally applicable.

Planting.—In sheltered situations, trees may yet be planted; do not, however, plant in a hurry, but let the ground be thoroughly prepared, and in good condition. It is a commendable practice to prepare the holes now, throwing out the soil, and leaving it exposed, to be acted upon by frosts; by that means, it will acquire a friability not otherwise easily obtained. If you find it more convenient to get your trees now than in the spring, or if your orders have to come from a more northern locality than your own, by all means secure them at once; and, when they arrive, have a deep trench prepared, and lay them in closely, covering them well, at least one-half up their stems; they will then be ready to plant at the earliest fitting moment in spring—a matter of great importance. This is also the best season for transportation. In the hurry of spring work, trees are frequently exposed to parching winds, which are not so prevalent during the present month.

DELAWARE GRAPE.

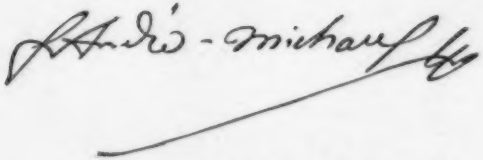
DELAWARE GRAPE.



Painted by Rembrant Peale

Engraved by H.B.Hall

F. ANDRIEW MICHAUX



FROM THE ORIGINAL PAINTING IN POSSESSION OF Dr J CARSON

PLAZA DE ARMAS, AND GOVERNOR'S RESIDENCE.